Sun Fire™ V20z and Sun Fire V40z Servers

User Guide

Sun Microsystems, Inc.
www.sun.com

Part No. 817-5248-14
March 2005, Revision A

Submit comments about this document at: `http://www.sun.com/hwdocs/feedback`

Copyright 2005 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, U.S.A. All rights reserved.

Sun Microsystems, Inc. has intellectual property rights relating to technology that is described in this document. In particular, and without limitation, these intellectual property rights may include one or more of the U.S. patents listed at `http://www.sun.com/patents` and one or more additional patents or pending patent applications in the U.S. and in other countries.

This document and the product to which it pertains are distributed under licenses restricting their use, copying, distribution and decompilation. No part of the product or of this document may be reproduced in any form by any means without prior written authorization of Sun and its licensors, if any.

Third-party software, including font technology, is copyrighted and licensed from Sun suppliers.

Parts of the product may be derived from Berkeley BSD systems, licensed from the University of California. UNIX is a registered trademark in the U.S. and in other countries, exclusively licensed through X/Open Company, Ltd.

Sun, Sun Microsystems, the Sun logo, AnswerBook2, docs.sun.com, Sun Fire and Solaris are trademarks or registered trademarks of Sun Microsystems, Inc. in the U.S. and in other countries.

All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. in the U.S. and in other countries. Products bearing SPARC trademarks are based upon an architecture developed by Sun Microsystems, Inc.

The OPEN LOOK and Sun™ Graphical User Interface was developed by Sun Microsystems, Inc. for its users and licensees. Sun acknowledges the pioneering efforts of Xerox in researching and developing the concept of visual or graphical user interfaces for the computer industry. Sun holds a non-exclusive license from Xerox to the Xerox Graphical User Interface, which license also covers Sun's licensees who implement OPEN LOOK GUIs and otherwise comply with Sun's written license agreements.

U.S. Government Rights—Commercial use. Government users are subject to the Sun Microsystems, Inc. standard license agreement and applicable provisions of the FAR and its supplements.

DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID.

Copyright 2005 Sun Microsystems, Inc., 4150 Network Circle, Santa Clara, California 95054, États-Unis. Tous droits réservés.

Sun Microsystems, Inc. a les droits de propriété intellectuelle relatants à la technologie qui est décrite dans ce document. En particulier, et sans la limitation, ces droits de propriété intellectuelle peuvent inclure un ou plus des brevets américains énumérés à `http://www.sun.com/patents` et un ou les brevets plus supplémentaires ou les applications de brevet en attente dans les États-Unis et dans les autres pays.

Ce produit ou document est protégé par un copyright et distribué avec des licences qui en restreignent l'utilisation, la copie, la distribution et la décompilation. Aucune partie de ce produit ou document ne peut être reproduite sous aucune forme, par quelque moyen que ce soit, sans l'autorisation préalable et écrite de Sun et de ses bailleurs de licence, s'il y en a.

Le logiciel détenu par des tiers, et qui comprend la technologie relative aux polices de caractères, est protégé par un copyright et licencié par des fournisseurs de Sun.

Des parties de ce produit pourront être dérivées des systèmes Berkeley BSD licenciés par l'Université de Californie. UNIX est une marque déposée aux États-Unis et dans d'autres pays et licenciée exclusivement par X/Open Company, Ltd.

Sun, Sun Microsystems, le logo Sun, AnswerBook2, docs.sun.com, Sun Fire et Solaris sont des marques de fabrique ou des marques déposées de Sun Microsystems, Inc. aux États-Unis et dans d'autres pays.

Toutes les marques SPARC sont utilisées sous licence et sont des marques de fabrique ou des marques déposées de SPARC International, Inc. aux États-Unis et dans d'autres pays. Les produits portant les marques SPARC sont basés sur une architecture développée par Sun Microsystems, Inc.

L'interface d'utilisation graphique OPEN LOOK et Sun a été développée par Sun Microsystems, Inc. pour ses utilisateurs et licenciés. Sun reconnaît les efforts de pionniers de Xerox pour la recherche et le développement du concept des interfaces d'utilisation visuelle ou graphique pour l'industrie de l'informatique. Sun détient une license non exclusive de Xerox sur l'interface d'utilisation graphique Xerox, cette licence couvrant également les licenciées de Sun qui mettent en place l'interface d'utilisation graphique OPEN LOOK et qui en outre se conforment aux licences écrites de Sun.

LA DOCUMENTATION EST FOURNIE «EN L'ÉTAT» ET TOUTES AUTRES CONDITIONS, DÉCLARATIONS ET GARANTIES EXPRESSES OU TACITES SONT FORMELLEMENT EXCLUES, DANS LA MESURE AUTORISÉE PAR LA LOI APPLICABLE, Y COMPRIS NOTAMMENT TOUTE GARANTIE IMPLICITE RELATIVE À LA QUALITÉ MARCHANDE, À L'APTITUDE À UNE UTILISATION PARTICULIÈRE OU À L'ABSENCE DE CONTREFAÇON.

Contents

Preface xi

How This Book is Organized xi

Using UNIX Commands xii

Shell Prompts xii

Typographic Conventions xiii

Related Documentation xiii

Accessing Sun Documentation xiv

Third-Party Web Sites xiv

Contacting Sun Technical Support xiv

Sun Welcomes Your Comments xiv

1. Introduction to the Sun Fire™ V20z and Sun Fire V40z Servers 1–1

1.1 Safety Guidelines 1–1

1.1.1 User Documentation 1–2

1.2 Overview of the Sun Fire V20z Server 1–2

1.2.1 Applications 1–3

1.2.2 Sun Fire V20z Features 1–3

1.2.3 Sun Fire V20z Hardware System Orientation 1–4

1.2.3.1 Sun Fire V20z Front and Back Panels 1–4

1.2.3.2 Sun Fire V20z System Components 1–6

1.3 Overview of the Sun Fire V40z Server 1–7
1.3.1 Applications 1–7
1.3.2 Sun Fire V40z Features 1–8
1.3.3 Sun Fire V40z Server Hardware System Orientation 1–9
1.3.3.1 Sun Fire V40z Front and Back Panels 1–9
1.3.3.2 Sun Fire V40z System Components 1–11
1.4 Shared Features of the Sun Fire V20z and Sun Fire V40z Servers 1–12
1.4.1 Server Management 1–12
1.4.1.1 Service Processor 1–12
1.4.1.2 Operator Panel 1–13
1.4.1.3 Front and Back Panel LEDs 1–18
1.5 Accessory Kits 1–19
1.6 Additional Options and Customer-Replaceable Components 1–21
1.7 Field-Replacement Units 1–24

2. Powering On and Configuring BIOS Settings 2–1
2.1 Powering On the Server 2–1
2.2 Powering Off the Server 2–3
2.3 Escape Sequences for Remote Console Terminal 2–4
2.4 BIOS Setup Utility 2–5
2.4.1 Main Menu 2–6
2.4.2 Advanced Menu 2–8
2.4.3 Security Menu 2–13
2.4.4 Power Menu 2–14
2.4.5 Boot Menu 2–14
2.4.6 Exit Menu 2–15
2.4.7 QuickBoot Feature 2–15
2.5 Booting From a USB Diskette Device 2–16

3. Maintaining the Sun Fire V20z Server 3–1

3.1 Tools and Supplies Needed 3–1

3.2 Powering Off the Server and Removing the Cover 3–2

3.2.1 Server Top-Cover Installation 3–3

3.3 Locations of Sun Fire V20z Components 3–4

3.3.1 SCSI ID Assignments 3–5

3.3.1.1 Linux-based Server 3–5

3.3.1.2 Solaris-based Server 3–5

3.4 Releases of the Sun Fire V20z Server 3–5

3.4.1 Versions of the Sun Fire V20z Server 3–6

3.4.1.1 Important Information 3–6

3.4.1.2 Solaris 9 OS Install-Time Update for a Super-FRU Replacement 3–7

3.4.2 No Mixing of CPU Stepping Versions 3–8

3.4.2.1 Verifying the Stepping Version of the CPU 3–8

3.4.3 Support Guide for Half-Length PCI Card Removed 3–11

3.5 Customer-Replaceable-Unit Replacement Procedures 3–12

3.5.1 I/O Board 3–13

3.5.2 PCI Card 3–14

3.5.2.1 Supported PCI Cards 3–14

3.5.2.2 Adding or Replacing a PCI Card 3–14

3.5.3 SCSI Hard Disk Drive and Carrier 3–16

3.5.3.1 Removing an HDD and Carrier 3–16

3.5.3.2 Installing an HDD and Carrier 3–17

3.5.4 SCSI Backplane 3–18

3.5.5 CD-ROM/DVD-ROM/Diskette Drive Assembly 3–21

3.5.6 Operator-Panel Board and LCD Display 3–23

3.5.7 Power Supply 3–24

3.5.8 Cooling Fans 3–26

3.5.9 Memory Voltage-Regulator Modules 3–28
3.5.10 CPU Voltage-Regulator Modules 3–29
3.5.10.1 Before You Start 3–29
3.5.10.2 Removing a CPU VRM 3–30
3.5.10.3 Replacing a CPU VRM 3–30
3.5.11 Memory Modules 3–31
3.5.11.1 Memory Module Population Rules 3–31
3.5.11.2 Removing a memory module 3–33
3.5.11.3 Installing a Memory Module 3–33
3.5.12 System Battery 3–34
3.5.12.1 Removing the System Battery 3–34
3.5.12.2 Replacing the System Battery 3–35
3.5.13 Cable Kit 3–35
3.5.14 CPUs and Heatsinks 3–37
3.5.14.1 One-CPU Configuration 3–37
3.5.14.2 Removing a Heatsink and CPU 3–37
3.5.14.3 Installing a CPU and Heatsink 3–40
3.5.15 Super-FRU 3–42
3.6 Sun Fire V20z Indicators, Switches and Jumpers 3–44
3.6.1 Sun Fire V20z Motherboard 3–44
3.6.2 Clear-CMOS Jumper 3–47

4. Maintaining the Sun Fire V40z Server 4–1
4.1 Tools and Supplies Needed 4–1
4.2 Powering Off the Server and Removing the Cover 4–2
4.3 Locations of Sun Fire V40z Components 4–3
4.3.1 SCSI ID Assignments 4–5
4.3.1.1 Linux-based Server 4–5
4.3.1.2 Solaris-based Server 4–5

4.4 Releases of the Sun Fire V40z Server 4–6

4.4.1 Versions of the Servers 4–6

4.4.1.1 Important Information 4–6

4.4.1.2 Solaris 9 OS Install-Time Update for a Super-FRU Replacement 4–7

4.4.2 No Mixing of CPU Stepping Versions 4–8

4.4.2.1 Verifying the Stepping Version of the CPU 4–8

4.5 Customer-Replaceable-Unit Replacement Procedures 4–12

4.5.1 PCI Card 4–13

4.5.1.1 Supported PCI Cards 4–13

4.5.1.2 Adding or Replacing a PCI Card 4–14

4.5.1.3 Sun Fire V40z Server PCI Card Slot Locations 4–14

4.5.1.4 Installing a Vertical PCI Card in a Vertical Slot 4–15

4.5.1.5 Installing a Horizontal PCI Card and Riser 4–17

4.5.2 SCSI Hard Disk Drive and Carrier 4–21

4.5.2.1 Removing an HDD and Carrier 4–21

4.5.2.2 Installing an HDD and Carrier 4–22

4.5.2.3 Installing an Optional Sixth HDD and Adapter 4–23

4.5.3 DVD-ROM/Diskette Drive Assembly 4–24

4.5.4 CPU Card 4–25

4.5.5 Operator Panel and LCD Assembly 4–29

4.5.6 SCSI Backplane Assembly 4–30

4.5.7 Cooling Fans 4–31

4.5.7.1 Fan Numbering 4–32

4.5.7.2 Replacing an Individual Cooling Fan 4–32

4.5.7.3 Replacing the Front Fan-Cage Assembly 4–34

4.5.7.4 Replacing the Rear Fan-Cage Assembly 4–35

4.5.8 Power Supplies and Power-Supply Cage Assembly 4–37
4.5.8.1 Replacing an Individual Power Supply 4–37
4.5.8.2 Replacing a Power-Supply Cage Assembly 4–39
4.5.9 Memory Voltage-Regulator Modules 4–41
4.5.9.1 Replacing a Memory VRM on the Motherboard 4–41
4.5.9.2 Replacing a Memory VRM on the CPU Card 4–42
4.5.10 CPU Voltage-Regulator Modules 4–44
4.5.10.1 Before You Start 4–44
4.5.10.2 Replacing a CPU VRM on the Motherboard 4–44
4.5.10.3 Replacing a CPU VRM on the CPU Card 4–47
4.5.11 Memory Modules 4–49
4.5.11.1 Memory Module Population Rules 4–49
4.5.11.2 Replacing a Memory Module on the Motherboard 4–51
4.5.11.3 Replacing a Memory Module on the CPU Card 4–52
4.5.12 CPUs and Heatsinks 4–53
4.5.12.1 Replacing a CPU on the Motherboard 4–54
4.5.12.2 Replacing a CPU on the Optional CPU Card 4–58
4.5.13 System Battery 4–63
4.5.14 Cable Kit 4–65
4.5.14.1 Remove System Components 4–65
4.5.14.2 Remove and Replace the Cables 4–68
4.5.14.3 Re-install the Components 4–73
4.5.15 Super FRU 4–76
4.6 Sun Fire V40z Indicators, Switches and Jumpers 4–78
4.6.1 Sun Fire V40z Motherboard and CPU Card 4–78
4.6.2 Clear-CMOS Jumper 4–80

A. System Specifications A–1

A.1 Sun Fire V20z Specifications A–1

A.1.1 Sun Fire V20z Physical Specifications A–1

A.1.2 Sun Fire V20z Power Specifications A–2

A.1.3 Sun Fire V20z Environmental Specifications A–2

A.2 Sun Fire V40z Specifications A–3

A.2.1 Sun Fire V40z Physical Specifications A–3

A.2.2 Sun Fire V40z Power Specifications A–3

A.2.3 Sun Fire V40z Environmental Specifications A–4

B. BIOS POST Codes B–1

C. SCSI BIOS Configuration Utility C–1

C.1 Starting the SCSI BIOS Configuration Utility C–1

C.2 Using the Configuration Utility C–2

C.2.1 User Input C–3

C.2.2 Main Menu C–3

C.2.3 Boot Adapter List C–5

C.2.4 Global Properties C–6

C.2.5 Adapter Properties C–7

C.2.6 Device Properties C–9

C.2.7 RAID Properties C–12

C.3 Quitting the SCSI BIOS Configuration Utility C–14

D. Supplemental Information D–1

D.1 RAID Support D–1

D.1.1 LSI Logic's Integrated RAID Solution D–2

D.1.2 Integrated Mirroring D–2

D.1.3 Zero-Channel RAID Not Supported D–3

D.1.4 Alternative Internal Drive RAID Configuration For Sun Fire V40z Servers (Only) D–3

Index Index–1

Preface

How This Book is Organized

Chapter 1 contains an overview of the Sun Fire V20z and Sun Fire V40z servers.

Chapter 2 contains information about how to power on the server and configure the BIOS.

Chapter 3 contains information about removing and replacing components in a Sun Fire V20z server.

Chapter 4 contains information about removing and replacing components in a Sun Fire V40z server.

Appendix A contains information about optimizing system performance.

Appendix B contains a listing of BIOS POST codes.

Appendix C contains reference information about using the Fusion-MPT SCSI BIOS Configuration Utility.

Appendix D contains supplemental information about hardware.

Using UNIX Commands

This document might not contain information about basic UNIX® commands and procedures such as shutting down the system, booting the system and configuring devices. See the following documents for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is located at:

  `http://docs.sun.com`

Shell Prompts

Shell	Prompt
C shell	*machine-name*`%`
C shell superuser	*machine-name*`#`
Bourne shell and Korn shell	`$`
Bourne shell and Korn shell superuser	`#`

Typographic Conventions

Typeface*	Meaning	Examples
`AaBbCc123`	The names of commands, files and directories; on-screen computer output	Edit your `.login` file. Use `ls -a` to list all files. `% You have mail.`
`AaBbCc123`	What you type, when contrasted with on-screen computer output	`% su` `Password:`
AaBbCc123	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the *User's Guide*. These are called *class* options. You *must* be superuser to do this. To delete a file, type `rm` *filename*.

* The settings on your browser might differ from these settings.

Related Documentation

Application	Title	Part Number
Safety information	*Important Safety Information for Sun Hardware Systems*	816-7190-xx
Safety notices and international compliance certification statements	*Sun Fire V20z and Sun Fire V40z Servers—Safety and Compliance Guide*	817-5251-xx
Hardware and system software installation	*Sun Fire V20z and Sun Fire V40z Servers—Installation Guide*	817-5246-xx
Server management	*Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide*	817-5249-xx
Operating-system installation	*Sun Fire V20z and Sun Fire V40z Servers—Linux Operating System Installation Guide*	817-5250-xx
Troubleshooting and diagnostics	*Sun Fire V20z and Sun Fire V40z Servers—Troubleshooting Techniques and Diagnositcs Guide*	817-7184-xx
Late-breaking information	*Sun Fire V20z and Sun Fire V40z Servers Release Notes*	817-1771-xx

Accessing Sun Documentation

You can view, print or purchase a broad selection of Sun documentation, including localized versions, at:

`http://www.sun.com/documentation`

Third-Party Web Sites

Sun is not responsible for the availability of third-party web sites mentioned in this document. Sun does not endorse and is not responsible or liable for any content, advertising, products or other materials that are available on or through such sites or resources. Sun will not be responsible or liable for any actual or alleged damage or loss caused by or in connection with the use of or reliance on any such content, goods or services that are available on or through such sites or resources.

Contacting Sun Technical Support

If you have technical questions about this product that are not answered in this document, go to:

`http://www.sun.com/service/contacting`

Sun Welcomes Your Comments

Sun is interested in improving its documentation and welcomes your comments and suggestions. You can submit your comments by going to:

`http://www.sun.com/hwdocs/feedback`

Please include the title and part number of your document with your feedback:

Sun Fire V20z and Sun Fire V40z Servers—User Guide, part number 817-5248-14

CHAPTER 1

Introduction to the Sun Fire™ V20z and Sun Fire V40z Servers

This chapter contains an overview of the Sun Fire™ V20z and Sun Fire V40z servers.

This chapter contains the following sections:

- "Overview of the Sun Fire V20z Server" on page 1-2
- "Overview of the Sun Fire V40z Server" on page 1-7
- "Shared Features of the Sun Fire V20z and Sun Fire V40z Servers" on page 1-12
- "Accessory Kits" on page 1-19
- "Additional Options and Customer-Replaceable Components" on page 1-21

1.1 Safety Guidelines

You can safely connect the Sun Fire V20z and V40z servers to an IT Power System.

The use of the black-on-yellow"exclamation-point-in-a-triangle" symbol on the product indicates a reference to the following important safety information, concerning National Deviations for Finland, Norway and Sweden:

- **English:** The earthed-style attachment plug on the power-supply cord requires the socket outlet to be an earthing type.
- **Finnish:** Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan.
- **Norwegian:** Apparatet må tilkoples jordet stikkontakt.
- **Swedish:** Apparaten skall anslutas till jordat uttag.

1.1.1 User Documentation

For the most up-to-date user documentation, for both the Sun Fire V20z and Sun Fire V40z servers, please visit the following Web site:

```
http://www.sun.com/products-n-solutions/hardware/docs/
Servers/Workgroup_Servers/Sun_Fire_V20z/index.html
```

This site contains the user manuals, the Release Notes and the individual guides for each of the customer-replaceable units (CRUs).

To verify whether a document on the site is more recent than the document that you have, refer to the final two digits (the dash-roll) of the Part Number for that document.

Note – A document explaining the differences among the released versions of the Sun Fire V20z and Sun Fire V40z servers is also available at this Web site. Refer to part number (PN) 817-7185.

1.2 Overview of the Sun Fire V20z Server

The Sun Fire V20z is an AMD Opteron™ processor-based enterprise-class 1U 2P server. The Sun Fire V20z provides performance and value to an enterprise environment, offering significantly better performance than current 32-bit Intel-based solutions. The balanced server design maximizes overall performance through industry-leading I/O options, and delivers compelling real-world workload performance.

The Sun Fire V20z server includes an embedded service processor (SP), flash memory, RAM, a separate Ethernet interface and server-management software. It comes equipped with superior server-management tools for greater control and minimum total cost of ownership. You can use the command line interface or SNMP integration with third-party frameworks to configure and manage the platform with the SP. The dedicated SP provides complete operating-system independence and maximum availability of server management.

1.2.1 Applications

The Sun Fire V20z server is ideal for the following applications:

- Web or application hosting
- High-performance compute clusters
- Offsite/remote server installations
- Database workloads
- Corporate data centers

1.2.2 Sun Fire V20z Features

TABLE 1-1 shows the main features of the Sun Fire V20z server.

Note – Visit the product Web site for the most up-to-date information on the product features: `http://www.sun.com/servers/entry/v20z.`

TABLE 1-1 Sun Fire V20z Server Features

Component	Description
CPU	2 AMD Opteron processors 64-bit x86 architecture
Memory	512 MB–16 GB ECC, registered DDR (8 slots, 3.05 cm max. height)
Hard Drives	1 or 2 U320 SCSI (only in integrated mirroring configurations—see "Integrated Mirroring" on page D-2)
SCSI Controller	Embedded U320 controller with potential mirroring support
Network I/O	Dual embedded Gigabit Ethernet
PCI I/O	2 PCI-X expansion slots: • 1 full-length 66 MHz/64-bit or 133 MHz/64-bit • 1 half-length 66 MHz/64-bit
Other I/O	Internal CD-ROM (or DVD-ROM) and diskette drive Embedded SVGA video, keyboard and mouse connectors
Management Service	PowerPC running embedded server and SSL encryption for secure management from anywhere and two dedicated 10/100 Ethernet ports to the SP.

1.2.3 Sun Fire V20z Hardware System Orientation

Before performing any service procedures, become familiar with the physical orientation and features of your Sun Fire V20z server.

1.2.3.1 Sun Fire V20z Front and Back Panels

FIGURE 1-1 shows the front panel of the Sun Fire V20z server.

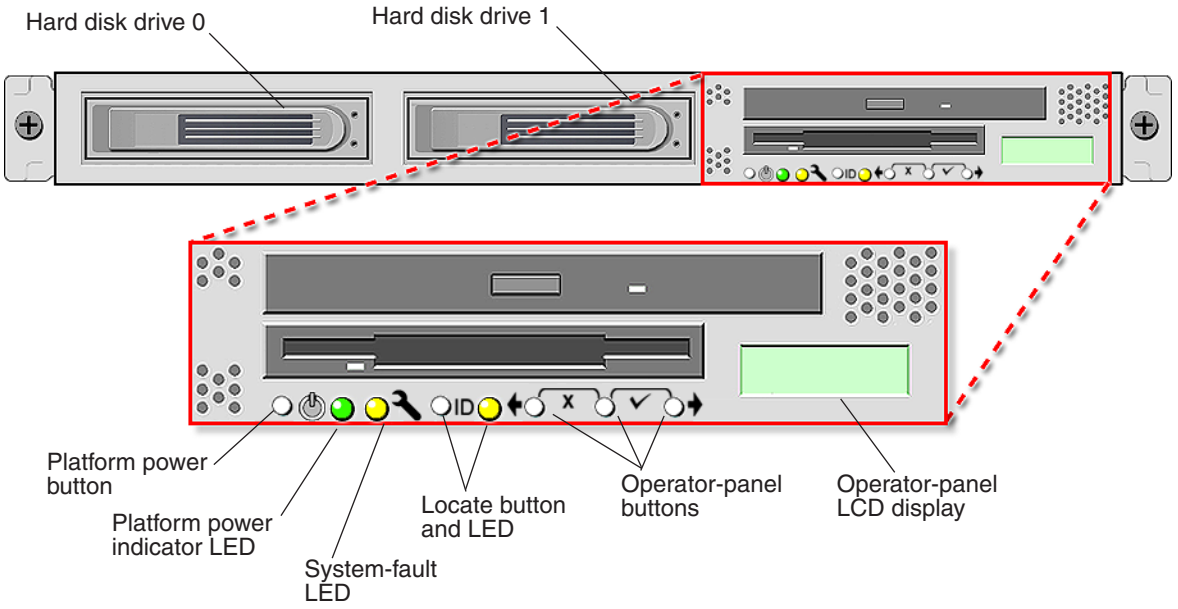

FIGURE 1-1 Front Panel of the Sun Fire V20z Server

Refer to "Operator Panel" on page 1-13 for more information about the operator panel.

FIGURE 1-2 shows the back panel of the Sun Fire V20z server:

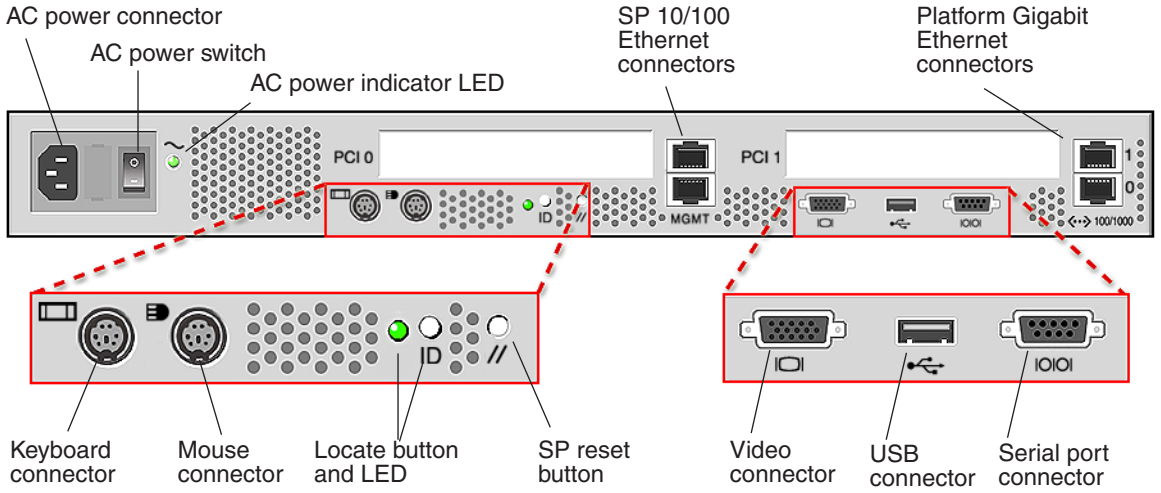

FIGURE 1-2 Back Panel of the Sun Fire V20z Server

Ethernet Port Labelling

It is important to note the labelling of the ethernet ports on the back panel of the Sun Fire V20z server. As shown on the far right side of the server illustrated in FIGURE 1-2, interfaces `eth1` and `eth0` are labelled as "1" on the upper port and "0" on the bottom port, respectively.

PCI Slot Labelling

The PCI slots are labelled on the server back panel as PCI O (next to the power supply) and PCI 1 (between the SP and platform ethernet ports). See FIGURE 1-2.

- The slot on the motherboard that corresponds to PCI 0 is identified by the silkscreen label "Slot 2 133MHz".
- The slot on the motherboard that corresponds to PCI 1 is identified by the silkscreen label "Slot 1 66MHz".

1.2.3.2 Sun Fire V20z System Components

FIGURE 1-3 shows the locations of the components inside the Sun Fire V20z chassis.

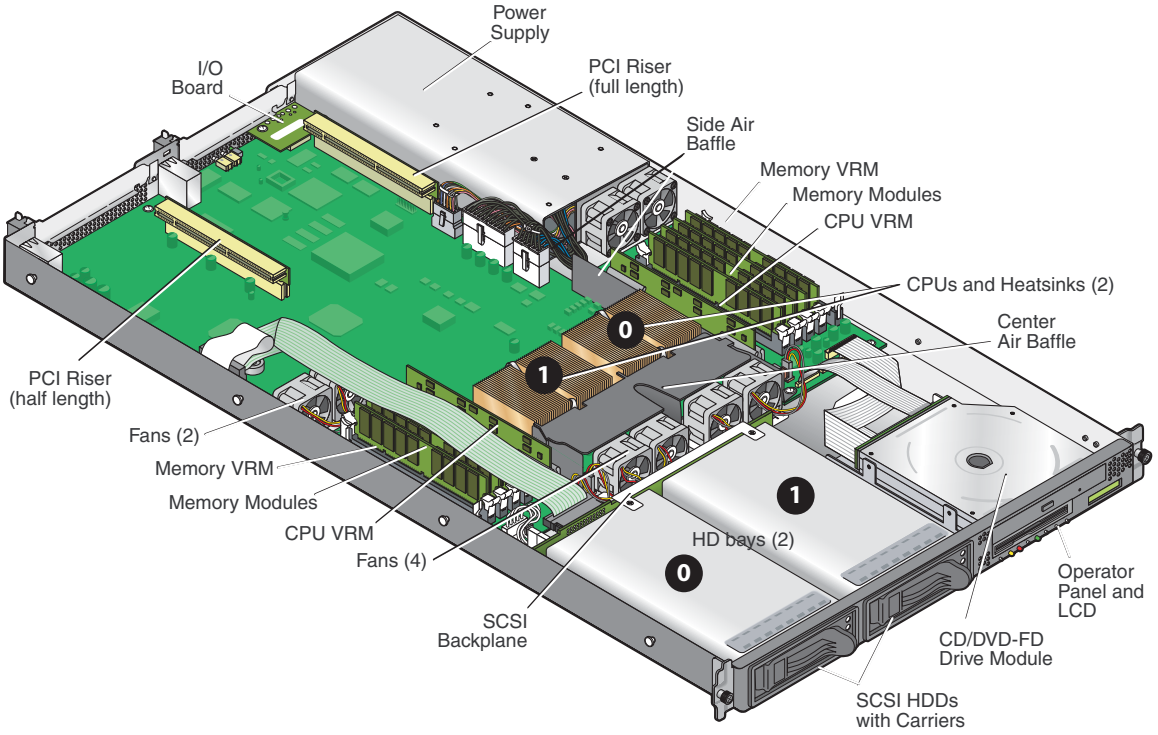

FIGURE 1-3 Location of System Components in the Sun Fire V20z Server

1.3 Overview of the Sun Fire V40z Server

The Sun Fire V40z server is an AMD Opteron Processor-based enterprise-class 3U 4P server. The Sun Fire V40z server provides performance and value to an enterprise environment, offering significantly better performance than current solutions. The AMD Opteron processor implements the x86-64 architecture, which delivers 64-bit capability. In addition, it delivers significant memory capacity and bandwidth, with twice the memory capacity and up to three times the memory bandwidth of existing 32-bit x86 servers.

The Sun Fire V40z server includes an embedded Service Processor (SP), flash memory, RAM, a separate Ethernet interface, shadow password support and server-management software. It comes equipped with superior server-management tools for greater control and minimum total cost of ownership. You can use the command line interface or SNMP integration with third-party frameworks to configure and manage the platform with the SP. The dedicated SP provides complete operating-system independence and maximum availability of server management.

1.3.1 Applications

The Sun Fire V40z server is ideal for the following applications:

- Web or application hosting
- High-performance compute clusters
- Offsite/remote server installations
- Database workloads
- Corporate data centers

1.3.2 Sun Fire V40z Features

TABLE 1-1 shows the main features of the Sun Fire V40z server.

Note – Visit the product Web site for the most up-to-date information on the product features: `http://www.sun.com/servers/entry/v40z`.

TABLE 1-2 Sun Fire V40z Server Features

Component	Description
CPU	4 AMD Opteron processors 64-bit x86 architecture
Memory	512 MB–64 GB ECC, registered DDR (16 slots, 3.05 cm max. height)
Hard Drives	Up to 5 U320 SCSI (only in integrated mirroring configurations—see “Integrated Mirroring” on page D-2)
SCSI Controller	Embedded U320 controller with potential mirroring support
Network I/O	Dual embedded Gigabit Ethernet
PCI I/O	7 PCI-X expansion slots: • 4 full-length, 133 MHz/64-bit, vertical slots • 1 full-length, 100 MHz/64-bit, vertical slot • 1 half-length, 100 MHz/64-bit, vertical slot • 1 half-length, 66MHz/64-bit, horizontal slot (with riser)
Other I/O	Internal DVD-ROM and diskette drive Embedded SVGA video, keyboard and mouse connectors
Management Service	PowerPC running embedded server and SSL encryption for secure management from anywhere and two dedicated 10/100 Ethernet ports to the SP.

1.3.3 Sun Fire V40z Server Hardware System Orientation

Before performing any service procedures, become familiar with the physical orientation and features of your Sun Fire V40z server.

1.3.3.1 Sun Fire V40z Front and Back Panels

FIGURE 1-4 shows the front panel of the Sun Fire V40z server.

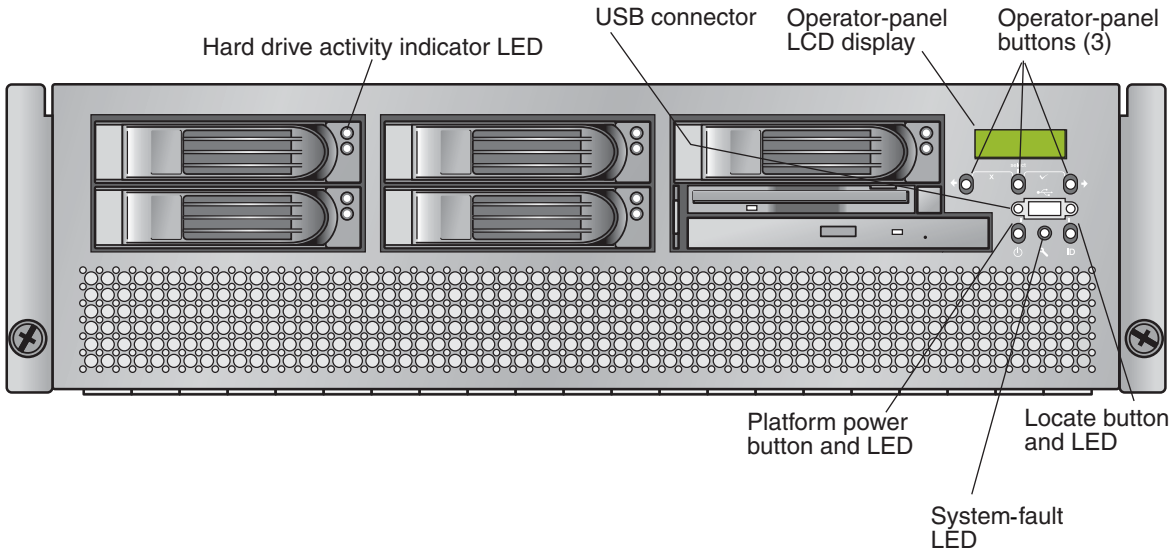

FIGURE 1-4 Front Panel of the Sun Fire V40z Server

Refer to "Operator Panel" on page 1-13 for more information about the operator panel.

FIGURE 1-5 shows the back panel of the Sun Fire V40z server:

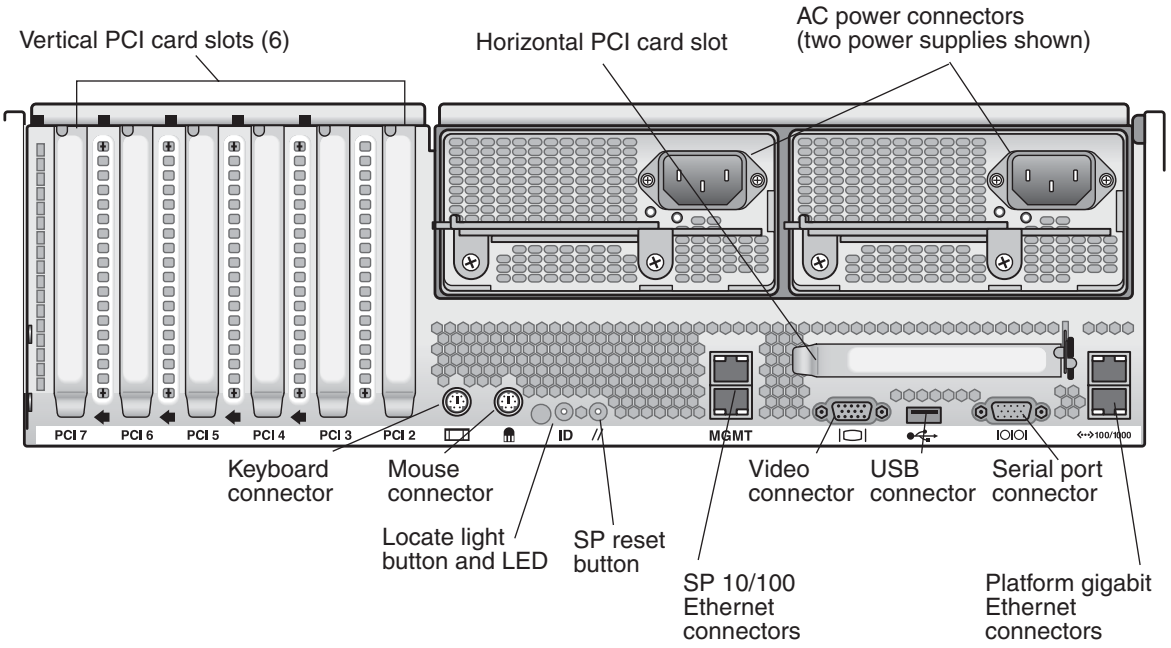

FIGURE 1-5 Back Panel of the Sun Fire V40z Server

Ethernet Port Labelling

It is important to note the labelling of the ethernet ports on the back panel of the Sun Fire V40z server. Referring to the platform gigabit (Gb) ethernet ports at the right edge of the chassis (see FIGURE 1-5), the lower ethernet interface is `eth0` andthe upper interface is `eth1`, respectively.

1.3.3.2 Sun Fire V40z System Components

FIGURE 1-6 shows the locations of the components inside the Sun Fire V40z chassis.

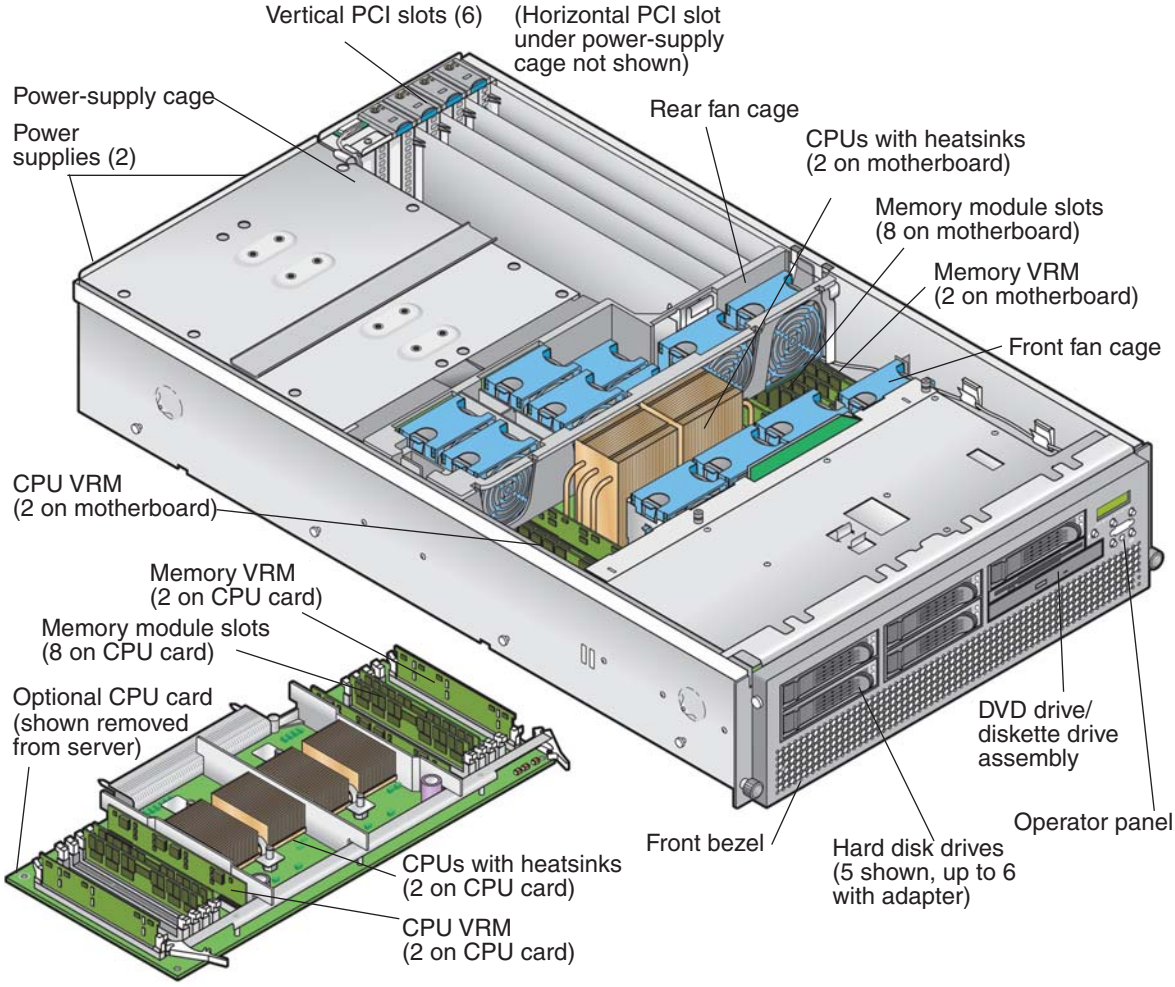
Vertical PCI slots (6)
(Horizontal PCI slot under power-supply cage not shown)
Power-supply cage
Power supplies (2)
Rear fan cage
CPUs with heatsinks (2 on motherboard)
Memory module slots (8 on motherboard)
Memory VRM (2 on motherboard)
Front fan cage
CPU VRM (2 on motherboard)
Memory VRM (2 on CPU card)
Memory module slots (8 on CPU card)
Optional CPU card (shown removed from server)
DVD drive/ diskette drive assembly
Operator panel
Front bezel
Hard disk drives (5 shown, up to 6 with adapter)
CPUs with heatsinks (2 on CPU card)
CPU VRM (2 on CPU card)

FIGURE 1-6 Sun Fire V40z System Components

1.4 Shared Features of the Sun Fire V20z and Sun Fire V40z Servers

1.4.1 Server Management

Strong server-management capabilities are crucial to maintaining mission-critical servers. Advance notification of problems and rapid diagnosis and correction are critical functions to an environment in which a few servers bear most of the workload. These servers and their extensive server-management capabilities lower costs by reducing failure and potentially eliminating hands-on management.

1.4.1.1 Service Processor

These servers include a dedicated service processor (SP) for complete operating-system independence and maximum availability of server management. The SP is an embedded PowerPC that provides the following:

- Environmental monitoring of the platform (such as temperatures, voltages, fan speeds and panel switches)
- Alert messages when problems occur
- Remote control of server operations (boot, shutdown and reboot of the server's operating system, turning the server's power on and off, stopping the server's boot process in BIOS, and upgrading the BIOS)

The SP runs an embedded version of Linux, and all the server-management functions are developed as standard Linux applications. Its sole purpose is to support server management; therefore, the full functionality of the operating system is not available in the SP. Many familiar applications, such as ftp and telnet, are not provided as they are not required to support the server-management feature set.

1.4.1.2 Operator Panel

You can use the operator panel to configure network settings for the service processor.

- FIGURE 1-1 shows the operator-panel location on the Sun Fire V20z front panel.
- FIGURE 1-4 shows the operator-panel location on the Sun Fire V40z front panel.

The drivers for the server must be installed to access these menu options. Some operator-panel menus are only functional under these conditions:

- An external file system is configured with the Network Share Volume (NSV).
- The SP update server from the NSV machine is available.
- The NSV machine has Java™ Runtime Environment 1.4.2 (or later) installed on it.

The liquid-crystal display (LCD) panel on the operator panel displays menu options with `Menu:` appearing in the first line and the menu option in the second line. When no menu option is available, the first line displays SP information, such as the IP address, and the second line provides platform information. For example:

```
123.45.67.89
OS running
```

TABLE 1-3 shows the operator-panel buttons that are used to navigate through the menu options.

TABLE 1-3 Operator-Panel Buttons

Button	Function
	Back/No
	Select
	Forward/Yes
	Enter
	Cancel

The Back/No and Forward/Yes buttons automatically scroll, repeating the action as long as the button is held down. After the button is held down a few seconds, auto scrolling begins and rapidly increments or decrements the value.

If a menu or data-entry screen displays for more than 30 seconds with no action taken, the menu or data entry is cancelled and the display returns to the idle/background state.

TABLE 1-4 lists the operations you can perform from the operator panel:

TABLE 1-4 Operator-Panel Menu Options

Menu	Menu Options	Description
Server	Shutdown server	Signals the server operating system (OS) to shut down and power off. To force the power off in the case in which the OS hangs, the operator must hold the power button for four seconds.
	Reboot server	Signals the server OS to shut down and reboot.
	Show DIMM Errs	Displays memory-module errors.
	Clear DIMM Errs	Clears memory-module errors. (For more information, refer to "System-Fault Events" in the *Sun Fire V20z and Sun Fire V40z Servers—Troubleshooting Techniques and Diagnostics Guide*, 817-7184.)
	Display Port 80	Displays the last ten Port 80 codes (in hex, 5 per line). Press any button to clear the display. The display automatically clears after 30 seconds. This feature only works in BIOS booting state; to see all the post codes, run the subcommand `sp get port80 -m`.
SP	Set SP IP information	Configures the SP network using DHCP or a static IP address. (For more information, refer to *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide,* 817-5246.)
	Autoconfigure	Propagates SP-configuration information from one SP to one or more others. (For more information, refer to *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide,* 817-5249.)
	Update SP Flash	Updates SP software. (For more information, refer to *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide,* 817-5249.)

TABLE 1-4 Operator-Panel Menu Options *(Continued)*

Menu	Menu Options	Description
	Dump SP	Invokes the Troubleshooting Dump Utility (TDU), which captures the following information and either sends it to stdout or stores it in an output file: • system state table (SST) • hardware and software component versions • machine check register values • CPU trace buffers • CPU configuration space registers (CSR) • event log file • the last good configuration (LGC) By default, the TDU data is redirected to `stdout`. If there is an NFS-mounted directory, the log is placed on a mounted NFS filesystem, with the following path and file name: `/logs/<sp hostname>/tdulog.tar`. ***Note*:** You can also invoke the TDU running the subcommand `sp get tdulog`.
	Use defaults	Restores SP settings to the default factory configuration. ***Note:*** All current data (users, network configuration, ssh and events) and IPMI settings are lost, and the SP is rebooted.
	Set SP IP Info	Configures the SP network using DHCP or a static IP address. (For more information, refer to Chapter 2 in the *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide*, 817-5246.)
	Reboot SP	Forces the SP to shut down and reboot. ***Note:*** The platform OS is not affected.
	Config Console	Allows you to configure rear-panel serial port to be SP or platform.
	Display Sensors	Displays current sensor readings for each sensor type • The Left and Right arrow buttons display sensor types. • The Select button displays the sensor readings in alphabetical order by unique ID. • For LEDs, the Select button toggles the state of the LED on or off.

TABLE 1-4 Operator-Panel Menu Options *(Continued)*

Menu	Menu Options	Description
	Display HW Inv	To use this option: • The Left and Right arrow buttons display inventory items. • The Select button displays the fields that are available for each item. • For LEDs, the Select button toggles the state of the LED on or off. The individual fields reported are: ***Note:*** Blank fields are skipped. • name • attribute • OEM • serial number • part number • revision • assembly number • assembly revision • firmware ID • firmware revision • software ID • software revision • date of manufacture
	Display SW Inv	To use this option: • The Left and Right arrow buttons display inventory items. • The Select button displays the fields that are available for each item. • Also displayed is the version and date of installation.
Panel	Use SP hostname	Displays the networking host name of the SP in the top line instead of its numeric IP address.

TABLE 1-4 Operator-Panel Menu Options *(Continued)*

Menu	Menu Options	Description
	Name for LCD	Displays a custom name for the SP in the LCD. (For more information, refer to *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide*.)
	Clear LCD name	Removes the user-specified name for the SP. Either the host name or the IP address displays in the first line.
	Rotate IP/Name	The first line of the LCD alternates every five seconds. For example, the custom name for the LCD or host name displays, then the IP address, then back, and so on every five seconds. If you set the Name for LCD, it displays in the top line. If you do not set the Name for LCD and you do specify to Use SP host name, the host name displays in the top line. If you specify neither the Name for LCD nor the Use SP host name options, the numeric IP address displays.

1.4.1.3 Front and Back Panel LEDs

TABLE 1-5 describes the functions of the LEDs on the front panel of the server and TABLE 1-6 describes the functions of the LEDs on the back panel.

- Refer to FIGURE 1-1 and FIGURE 1-2 for the locations of these LEDs on the Sun Fire V20z server.
- Refer to FIGURE 1-4 and FIGURE 1-5 for the locations of these LEDs on the Sun Fire V40z server.

TABLE 1-5 Front Panel LED Functions

LED	Description
Platform Power	This LED is lit when the platform power is on.
System Fault	This LED blinks when a severe system fault, such as an over-voltage condition or an upper temperature limit, is detected. Refer to "System-Fault Events" in the *Sun Fire V20z and Sun Fire V40z Servers— Troubleshooting Techniques and Diagnostics Guide,* 817-7184.
Locate	This LED is lit when you press the Locate button on either the front or the back of the server. This LED helps you to identify which system in the rack you are working on in a rack full of servers. You can also turn on this LED remotely through SP commands (refer to the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide,* 817-5249).

TABLE 1-6 Back Panel LED Functions

LED	Description
AC Power Indicator	This LED is lit when the AC power is on.
Locate	This LED is lit when you press the Locate button on either the front or the back of the server. This LED helps you to identify which system in the rack you are working on in a rack full of servers.

1.5 Accessory Kits

TABLE 1-7 lists the contents of the accessory kits for the Sun Fire V20z and Sun Fire V40z servers. The only difference between the two accessory kits is the Setup Poster for each of the servers.

TABLE 1-7 Contents of the Accessory Kits for the Sun Fire V20z and Sun Fire V40z Servers

Item	Part Number	Quantity	Delivery
Sun Fire V20z and Sun Fire V40z Servers Documentation and Support Files CD-ROM.	705-1308	1	CD
At the top level of this CD: *Third-Party License Agreements*			
The following documents are included in the directory `/documentation` :			
• *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide*	817-5246		
• *Sun Fire V20z and Sun Fire V40z Servers—User Guide*	817-5248		
• *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide*	817-5249		
• *Sun Fire V20z and Sun Fire V40z Servers—Linux Operating System Installation Guide*	817-5250		
• *Sun Fire V20z and Sun Fire V40z Servers—Safety and Compliance Guide*	817-5251		
• *Sun Fire V20z and Sun Fire V40z Servers—Troubleshooting Techniques and Diagnostics Guide*	817-7184		
• *Pointer Document to Web site with the most current user documentation*	819-1777		
• *ReadMe for the Bootable Diagnostics CD-ROM*	819-1810		
• *ReadMe for Configuring the Solaris™ 10 OS Preinstalled on the Server*	819-1811		
• *Installation Guide for the ITU for Solaris™ 9 OS*	819-1812		
The following files are included in the directory `/support_files` :			

TABLE 1-7 Contents of the Accessory Kits for the Sun Fire V20z and Sun Fire V40z Servers *(Continued)*

Item	Part Number	Quantity	Delivery
• Support Resources Files The directory contains important files that are used in supporting the server. This includes updated drivers and files for creating a networked installation server. For more information, refer to the `README.txt` file found in this directory.	N/A		
Sun Fire V20z and Sun Fire V40z Servers Network Share Volume CD-ROM	705-1307	1	CD
Sun Fire V20z and Sun Fire V40z Servers Bootable Diagnostics CD-ROM	705-1309	1	CD
Sun Installation Assistant CD-ROM (for Linux OS installations)	705-1183	1	CD
Install-Time Update (ITU) for Solaris™ 9 OS	702-4543	1	Floppy Diskette
Installation Guide for the ITU for Solaris™ 9 OS	819-1812	1	Printed
Sun Fire V20z and Sun Fire V40z Servers Release Notes	819-1771	1	Printed
Pointer Document to Web site with the most current user documentation	819-1777	1	Printed
Sun Fire V20z and Sun Fire V40z Servers Warranty Pointer and Privacy Disclaimer Sheet	817-5254	1	Printed
Setting Up the Sun Fire V20z Server (poster) *(Sun Fire V20z server only)*	817-5336	1	Printed
Setting Up the Sun Fire V40z Server (poster) *(Sun Fire V40z server only)*	817-5337	1	Printed
Important Safety Information for Sun Hardware Systems	816-7190	1	Printed
Sun Fire V20z and Sun Fire V40z Servers Binary Code License	817-5253	1	Printed
Sun Fire V20z and Sun Fire V40z Servers Third-Party Software License Agreement	817-5338	1	Printed
Sun Microsystems Software License Agreement (multilingual)	819-0764	1	Printed
Entitlement for Solaris 10 (3/05) Operating System	819-1755	1	Printed

1.6 Additional Options and Customer-Replaceable Components

Note – For the most up-to-date list of available components, visit the following Sun Web sites:
`http://sunsolve.sun.com/handbook_pub/Systems/SunFireV20z/components.html`
and
`http://sunsolve.sun.com/handbook_pub/Systems/SunFireV40z/components.html`

Sun offers additional options as well as customer-replaceable components for the servers. The components for both the Sun Fire V20z and Sun Fire V40z servers are shown in TABLE 1-8.

To order these parts, contact your local Sun sales representative. You may have a part that is replaceable under warranty. For specific details regarding your warranty, refer to:

`http://www.sun.com/service/support/warranty/index.html`

TABLE 1-8 Additional Options and Customer-Replaceable Components for the Sun Fire V20z and Sun Fire V40z Servers

Sun Fire V20z	Sun Fire V40z	Component	Additional Options	Customer-Replaceable Components
		CPU/Heatsink Kit		
X		• Opteron 242, 1.6 GHz, C0 Stepping	595-7376-xx	F370-6695-xx
X		• Opteron 244, 1.8 GHz, C0 Stepping	595-7336-xx	F370-6670-xx
X		• Opteron 248, 2.2 GHz, C0 Stepping	595-7337-xx	F370-6672-xx
X		• Opteron 244, 1.8 GHz, CG Stepping	594-0368-xx	F370-6783-xx
X		• Opteron 248, 2.2 GHz, CG Stepping	594-0369-xx	F370-6785-xx
X		• Opteron 250, 2.4 GHz, CG Stepping	595-7579-xx	F370-6786-xx
X		• Opteron 252, 2.6 GHz, E Stepping	594-0371-xx	F370-7272-xx
	X	• Opteron 844, 1.8 GHz, CG Stepping	N/A	F370-6902-xx
	X	• Opteron 848, 2.2 GHz, CG Stepping	N/A	F370-6904-xx
	X	• Opteron 850, 2.4 GHz, CG Stepping	N/A	F370-6939-xx

TABLE 1-8 Additional Options and Customer-Replaceable Components for the Sun Fire V20z and Sun Fire V40z Servers *(Continued)*

Sun Fire V20z	Sun Fire V40z	Component	Additional Options	Customer-Replaceable Components
	X	• Opteron 852, 2.6 GHz, E Stepping	N/A	F370-7706-xx
		Memory		
X	X	• 1 GB ECC DDR/333 (2 x 512 MB DIMMs)	595-7339-xx	F370-6643-xx
X	X	• 2 GB ECC DDR/333 (2 x 1 GB DIMMs)	595-7340-xx	F370-6644-xx
X		• 4 GB ECC DDR/333 (2 x 2 GB DIMMs)	595-7341-xx	F370-6645-xx
	X	• 4 GB ECC DDR/333 (2 x 2 GB DIMMs)	595-7599-xx	F370-7063-xx
X	X	• 1 GB ECC DDR/400 (2 x 512 MB DIMMs)	594-0663-xx	F540-6427-xx
X	X	• 2 GB ECC DDR/400 (2 x 1 GB DIMMs)	594-0664-xx	F540-6428-xx
X	X	• 4 GB ECC DDR/400 (2 x 2 GB DIMMs)	594-0665-xx	F540-6429-xx
		Hard disk drives (HDDs) and SCSI Backplanes		
X		• 36 GB, Ultra 320 SCSI, 10K rpm	595-7342-xx	F370-6655-xx
X	X	• 73 GB, Ultra 320 SCSI, 10K rpm	595-7344-xx	F370-6689-xx
X	X	• 73 GB, Ultra 320 SCSI, 15K rpm	595-7578-xx	F370-6941-xx
X	X	• 146 GB, Ultra 320 SCSI, 10K rpm	595-7484-xx	F370-6905-xx
X	X	• 146 GB, Ultra 320 SCSI, 10K rpm (only supported for the Linux and Windows OSs)	594-1120-xx	F370-7813-xx
X	X	• 300 GB, Ultra 320 SCSI, 10K rpm	594-0669-xx	F370-7749-xx
X		• SCSI backplane	N/A	F370-6647-xx
	X	• SCSI backplane	N/A	F370-6926-xx
		PCI Option Cards and Riser Cards		
X	X	Ultra SCSI 320 dual port PCI-X card, full length card	595-7353-xx	F370-6682-xx
X	X	FC-AL 2 Gb/s PCI-X card, low profile 133 MHz card	595-7377-xx	F370-6697-xx
X	X	Single Gigabit Ethernet PCI-X NIC, low-profile 66 or 133 MHz card	595-7359-xx	F370-6685-xx
X	X	Dual Gigabit Ethernet PCI-X NIC, low-profile 66 or 133 MHz card	595-7360-xx	F370-6687-xx
X	X	Quad Gigabit Ethernet PCI-X NIC, low-profile 66 or 133 MHz card	595-7361-xx	F370-6688-xx
X	X	PCI-X RAID LSI MegaRAID with battery backup	594-0668-xx	F370-7748-xx

TABLE 1-8 Additional Options and Customer-Replaceable Components for the Sun Fire V20z and Sun Fire V40z Servers *(Continued)*

Sun Fire V20z	Sun Fire V40z	Component	Additional Options	Customer-Replaceable Components
X	X	Infiniband PCI-X HCA card	595-7580-xx	F370-6943-xx
X		PCI riser card	N/A	F370-6679-xx
	X	PCI riser card	N/A	F370-6920-xx
		Voltage-Regulator Modules (VRMs)		
X	X	CPU Voltage-Regulator Module (VRM)	N/A	F370-7746-xx
X	X	Memory Voltage-Regulator Module (VRM)	N/A	F370-7747-xx
		Optical Drives		
X		CD-ROM/Diskette combo unit	595-7347-xx	F370-6637-xx
X		DVD-ROM/Diskette combo unit	595-7348-xx	F370-6656-xx
	X	DVD-ROM/Diskette combo unit	596-7485-xx	F370-6906-xx
		Power Supplies		
X		Power supply	N/A	F370-6636-xx
	X	Power supply (2nd power supply)	595-7500-xx	F370-6916-xx
	X	Power-supply cage assembly	N/A	F370-6921-xx
		Cooling Fans		
X		Cooling fan (individual)	N/A	F370-6639-xx
	X	Cooling fan (individual)	N/A	F370-6922-xx
	X	Fan-cage assembly, front (holds four fans)	N/A	F370-7803-xx
	X	Fan-cage assembly, rear (holds eight fans)	N/A	F370-6924-xx
		Miscellaneous		
X		I/O board	N/A	F370-6678-xx
X		Operator panel	N/A	F370-6681-xx
	X	Operator-panel assembly	N/A	F370-6925-xx
X		System Cables kit	N/A	F370-6676-xx
	X	System Cables kit	N/A	F370-6584-xx
	X	Secondary Planer CPU card	N/A	F370-7778-xx
X	X	Rail rack-mount kit	595-7378-xx	N/A
	X	Cable management arm (for rack mounting)	595-7487-xx	N/A

1.7 Field-Replacement Units

Note – For the most up-to-date list of available components, visit the following Sun Web sites:
`http://sunsolve.sun.com/handbook_pub/Systems/SunFireV20z/components.html`
and
`http://sunsolve.sun.com/handbook_pub/Systems/SunFireV40z/components.html`

Field-replacement units (FRUs) are components that should be replaced by qualified technicians only.

The FRUs available for the Sun Fire V20z and Sun Fire V40z servers are shown in TABLE 1-9.

To order these parts, contact your local Sun sales representative. You may have a part that is replaceable under warranty. For specific details regarding your warranty, refer to:

`http://www.sun.com/service/support/warranty/index.html`

TABLE 1-9 Field-Replacement Units for the Sun Fire V20z and Sun Fire V40z Servers

Component	Field-Replaceable Components
Sun Fire V20z Server— Super FRU (chassis swap)	F380-1194-xx
Sun Fire V40z Server— Super FRU (chassis swap)	F380-1206-xx

CHAPTER 2

Powering On and Configuring BIOS Settings

This chapter contains instructions on powering on and configuring the server BIOS. Changing the BIOS parameters is only necessary if you want to change the defaults.

Before powering on the server for the first time, follow the instructions in the *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide* to set up your server.

This chapter contains the following sections:

- "Powering On the Server" on page 2-1
- "Escape Sequences for Remote Console Terminal" on page 2-4
- "BIOS Setup Utility" on page 2-5
- "Booting From a USB Diskette Device" on page 2-16

2.1 Powering On the Server

Note – Before powering on a server for the *first time*, follow the setup instructions in the *Sun Fire V20z and Sun Fire V40z Servers—Installation Guide*.

Caution – Before you power on a Sun Fire V40z server for the *first time*, you must remove the packaging inserts from the server's PCI card slots and CPU card slot to ensure proper air flow and cooling. You can discard these packaging inserts, which serve as protection during shipping. Do NOT remove the plastic air-baffle inserts from the PCI slots.

The updated release (chassis PN 380-1206) of the server does *not* ship with the packaging insert in the PCI card slots.

If you want to configure the server BIOS, you must use a PS/2 keyboard for initial bootup. USB keyboard support is disabled in the BIOS by default. See "BIOS Setup Utility" on page 2-5 for more information.

Caution – Do not operate this server without all fans, component heatsinks, air baffles and the cover installed. Severe damage to server components will occur if the server is operated without adequate cooling mechanisms.

Follow these steps to boot the server:

1. **Ensure that an AC power cord is plugged into each power connector on the rear of the server and into an AC power outlet(s).**
2. **Power on the server using one of the following two methods, depending on which server type you have:**
   - If you have a Sun Fire V20z server, use these steps:
   a. **Turn on the AC power switch on the server back panel (see** FIGURE 1-2**).**
      This switch provides AC power to the SP and basic hardware.
   b. **Push and release the platform power button on the server front panel (see** FIGURE 1-1**).**
      This button provides power to the BIOS, operating system and drivers.
   - If you have a Sun Fire V40z server, use this step:
   a. **Push and release the platform power button on the server front panel (see** FIGURE 1-4**).**
      This button provides power to the BIOS, operating system and drivers. There is no separate AC power switch on the Sun Fire V40z server; basic AC power is applied when you plug in a power cord to a power supply.

Note – If this is the first time you are booting the server, the booting stops and displays a message on the monitor, `Operating system not found`, and the LCD on the front panel displays the message, `OS Booting`. This is normal until after you install an operating system.

3. **When prompted, you can press the F2 key to enter the BIOS Setup Utility or press the F12 key to boot from the network. To boot from the default boot device, let the prompt time out and the boot process will continue.**
   For further information about the BIOS Setup Utility, refer to "BIOS Setup Utility" on page 2-5. For information about setting up a network PXE installation, see the *Sun Fire V20z and Sun Fire V40z Servers—Linux Operating System Installation Guide*.

2.2 Powering Off the Server

To perform a graceful shutdown of the server while running a Solaris, Linux or UNIX® operating system, use this procedure.

1. **Type the following command:**

   # **poweroff**

   This command shuts down the OS.

   Depending on which OS you are using, you may also have to push the platform power button on the front panel after the OS shuts down.

2. **Do one of the following actions, depending on which model of server you have:**
   - If you have a Sun Fire V20z server, turn off the AC power switch on the server back panel to remove AC power.
   - If you have a Sun Fire V40z server, disconnect all power cords from all power supplies to remove AC power.

2.3 Escape Sequences for Remote Console Terminal

If you are accessing your server using a remote console terminal, you might need to use the escape sequences shown in TABLE 2-1. If a regular function key is not working properly, use the escape sequence listed next to it in the table.

You will most likely need to use the escape sequences if you are using a Linux or Solaris OS.

TABLE 2-1 Special Keys for Remote Console Terminal

Function Key	Escape Sequence
HOME	<ESC> h
END	<ESC> k
INSERT	<ESC> +
DELETE	<ESC> -
PAGE UP	<ESC> ?
PAGE DOWN	<ESC> /
ALT	<ESC>^A
CTRL	<ESC>^C
F1	<ESC> 1
F2	<ESC> 2
F3	<ESC> 3
F4	<ESC> 4
F5	<ESC> 5
F6	<ESC> 6
F7	<ESC> 7
F8	<ESC> 8
F9	<ESC> 9
F10	<ESC> 0
F11	<ESC> !
F12	<ESC> @

2.4 BIOS Setup Utility

The basic input output system (BIOS) Setup utility can be used to configure BIOS settings. When the computer is powered on, it is configured with the values stored in the BIOS ROM by the system BIOS, which gains control at boot time. Changing these parameters is only necessary if you want to change the defaults.

To change the system parameters, enter the BIOS Setup utility by pressing the F2 key when prompted, as the system is booting.

Note – If you are using a USB keyboard, the F2 key might not work properly when entering BIOS Setup unless the F-Lock key is on.

During system boot, you can also press the F12 key to boot the network.

To access the BIOS Setup utility remotely, you can log in by means of an SSH client. Refer to the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide,* for more information about managing the server remotely.

From the Main menu screen, you can access other setup screens, such as Security and Power.

To navigate between items in a menu:

- Use the up and down arrow keys to move among the settings in each menu.
- Use the left and right arrow keys to change the options for each setting.

Items that include submenus begin with a triangle icon. To access a submenu, select the item so that it is highlighted and press Enter.

Note – You can use the Fusion-MPT SCSI BIOS Configuration Utility to change the default configuration of your SCSI host adapters. You may decide to alter these default values if there is a conflict between device settings or to optimize system performance. See Appendix D for details.

The tables in the following sections describe each parameter setting in the BIOS Setup Utility.

Note – For NSV version 2.2.0.x and higher, there are certain changes in the menu options. These changes are called out in the tables.

2.4.1 Main Menu

TABLE 2-2 shows the options that are available from the BIOS Main menu.

TABLE 2-2 BIOS Main Menu

Menu Option	Description	Default
System Time	Enter the system time (hours:minutes:seconds) in the specified fields and press Enter to save the data. Use the Tab key to move to the next field and use Shift+ Tab to move to the previous field.	Current time
System Date	Enter the current date in the month, day and year fields. Press Enter to save the data. Use the Tab key to move to the next field and use Shift + Tab to move to the previous field.	Current date
Legacy Diskette A	Set the type of diskette drive installed as diskette A. Options include: Disabled, 360KB 5.25 in, 1.2MB 5.25 in, 720KB 3.5 in, 1.44/1.25MB 3.5 in and 2.88MB 3.5 in. ***Note:*** 1.44/1.25MB 3.5-in. references a 1024-byte sector Japanese media format. This diskette requires a 3-mode floppy disk drive.	1.44MB /1.25MB 3.5 in.
Legacy Diskette B ***Note:*** This option not included in NSV v2.2.0.x	Sets the type of diskette drive installed as diskette B. Options include: Disabled, 360KB 5.25 in, 1.2MB 5.25 in, 720KB 3.5 in, 1.44/1.25MB 3.5 in and 2.88MB 3.5 in. ***Note:*** 1.44/1.25MB 3.5 references a 1024 byte sector Japanese media format. This diskette requires a 3-mode floppy disk drive.	Disabled

TABLE 2-2 BIOS Main Menu *(Continued)*

Menu Option	Description	Default
Primary Master (default: none)	Set the parameters of the IDE Primary Master/Subordinate and IDE Secondary Master slots. Press Enter to activate the submenu screen to configure each of these settings. The submenu options include:	
Primary Subordinate (default: none)	• *Type*: The type of IDE hard drive. Options include: Auto (allows BIOS to automatically determine the hard drive's capacity, number of heads, etc.), User, a number from 1 to 39 to select a predetermined type of hard drive, CD/DVD-ROM, ATAPI Removable and IDE Removable.	Auto Multisector
Secondary Master (default: CD-ROM)	• *Multi-Sector Transfers*: The number of transfer sectors. Options include: Disabled, 2, 4, 8 and 16 sectors.	Disabled
	• *LBA Mode Control*: Determines whether BIOS will access the IDE Primary Master Device via LBA mode. Options include: Enabled and Disabled.	Disabled
	• *32-bit I/O*: Selects the 32-bit I/O operation. Options include: Enabled and Disabled.	Disabled
	• *Transfer Mode*: Selects the transfer mode. Options include: Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and FPIO4/DMA2.	Standard
	• *Ultra DMA Mode*: Selects Ultra DMA Mode. Options include: Disabled, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, Mode 5 and Mode 6.	Disabled
HDD Post Write Buffer	Enable or disable HDD Post Write Buffer support.	Enabled
Large Disk Access Mode	For UNIX, Novell Netware or other OSs, select Other. If you are installing new software and the drive fails, change this selection and try again. Different OSs require different representations of drive geometries. Options include: DOS and Other.	DOS
Boot Summary	Enable or disable display of the system configuration on boot.	Disabled
System Memory	Displays how much system memory is recognized as present in the system.	Current memory
Extended Memory	Displays how much extended memory is recognized as present in the system.	Current memory

2.4.2 Advanced Menu

TABLE 2-3 shows the options that are available from the Advanced menu.

TABLE 2-3 BIOS Advanced Menu

Menu Option	Description	Default
Reset Configuration Data	Clears the Extended System Configuration Data (ECSD). Options include: Yes and No.	No
Multiprocessor Specification ***Note:*** This option is not included in NSV v2.2.0.x	Configures the MP Specification revision level. Some OSs require 1.1 for compatibility. Options include: 1.4 and 1.1.	1.4
PCI Interrupts From MP Table	Configures the MP Table with PCI Interrupt entries. Options include: Yes and No.	Yes
Machine Check Stop	If enabled, system stops when a machine check error occurs. If disabled, system reboots when a machine check error occurs. Only applies if your operating system does not have its own machine check handler. Double fault scenario: If enabled, the system stops when a second fatal machine check error occurs while processing a first fatal machine check (a double fault). If disabled, the system reboots during a double fault. This also applies to what occurs on the first fatal machine check if your operating system does not have its own machine check handler.	Disabled
QuickBoot Mode	Allows the system to skip tests while booting. Options include: Enabled and Disabled.	Disabled
Error Message Handling	Disabled allows system to automatically continue to boot after displaying a detected error. The other options display the `SETUP entry or resume boot prompt`, then wait for the specified period of time or forever, while a user chooses the action to take. Options include: Disabled, Wait 5 seconds, Wait 30 seconds, Wait Forever	Wait 30 seconds
Diagnostics Boot Mode ***Note:*** This option is new in NSV v2.2.0.x	Diagnostics Boot Mode can be enabled to provide platform diagnostics (CD Diags) with the same BIOS support provided to SP Diags. The default (Disabled) reflects that the platform is usually booted normally and not in diagnostic-support mode. Enabling this option is effective only for the next boot, after which it is reset to Disabled.	Disabled

TABLE 2-3 BIOS Advanced Menu *(Continued)*

Menu Option	Description	Default
Chipset Configuration ***Caution:*** Do not change the settings unless you are sure of what you are doing. Setting items on this menu to incorrect values may cause your system to malfunction.	Options for advanced chipset features. Options include:	
	• *SRAT Table*: Enables the ACPI 2.0 Static Resource Affinity Table for OSs that support an SRAT and will disable node interleaving. Disabled allows for node interleaving. Options include: Enabled and Disabled.	Enabled
	• *Node Interleave*: If set to Auto, node interleaving will be enabled if memory sizes match, SRAT table is disabled and if DRAM ECC scrubbing is disabled. Options include: Auto and Disabled.	Disabled
	• *Bank Interleave*: If set to Auto, bank interleaving is enabled if the memory size and type match. Options include: Auto and Disabled.	Auto
	• *ECC*: Enable or disable ECC check/correct mode. This is a global enable function for all blocks within the CPU core and North Bridge.	Enabled
	• *DRAM ECC*: If all memory in the system supports ECC (x72), enabling invokes initial scrub DRAM and enables system requests to DRAM to be checked and/or corrected. Options include: Enabled and Disabled.	Enabled
	• *ECC Scrub Redirection*: Enable or disable ECC Scrubber to correct errors detected in DRAM during normal CPU requests (foreground scrubbing).	Enabled
	• *Chip-Kill*: Enabled or disable the ChipKill ECC on nodes with all x4 ECC capable DIMMS.	Enabled
	• *DCACHE ECC Scrub CTL*: Sets the rate of background scrubbing for DCACHE lines. Options include: 5.12 µs, 10.2 µs, 20.5 µs, 41.0 µs, Disabled, 640 ns, 1.28 µs, 2.56 µs.	5.12 µs
	• *L2 ECC Scrub CTL*: Sets the rate of background scrubbing for L2 cache lines. Options include: 10.2 µs, 20.5 µs, 41.0 µs, 81.9 µs, Disabled, 1.28 µs, 2.56 µs, 5.12 µs.	10.2 µs
	• *DRAM ECC Scrub CTL*: Sets the rate of background scrubbing for DRAM (in addition to normal ECC scrubbing from system requests). Background agent works independently of CPU requests and bus masters, but cannot be enabled without first enabling DRAM ECC. Options include: 163.8 µs, 327.7 µs, 655.4 µs, 1.31 ms, Disabled, 20.5 µs, 41.0 µs, 81.9 µs.	163.8 µs
	• No Spec. TLB Reload: When this is at the default (Disabled), the translation look-aside buffer (TLB) is reloaded. When enabled, TLB reloading is turned off.	Disabled

TABLE 2-3 BIOS Advanced Menu *(Continued)*

Menu Option	Description	Default
I/O Device Configuration	Options for peripheral menu. Options include:	
	• *PS/2 Mouse*: Disabled prevents any installed PS/2 mouse from functioning, but frees up IRQ 12. Enabled forces the PS/2 mouse port to be enabled regardless of whether a mouse is present. Auto Detect enables the PS/2 mouse only if present. OS Controlled only displays if the OS controls the mouse.	Enabled
	• *Floppy Disk Controller*: Options include: Enabled (user configuration), Disabled (no configuration), Auto (BIOS or OS chooses configuration) and OS Controlled (displayed when controlled by the operating system).	Enabled
	• *USB Host Controller*: Enables or disables the USB hardware. Disabled resources are freed for other users.	Enabled
	• *USB BIOS Legacy Support*: Enables or disables support for USB devices. Enable for use with a non-USB-aware OS such as DOS, Linux or Solaris.	Disabled
	• *Onboard PCI IDE*: Enables the integrated local bus IDE adapter. Options include: Disabled, Primary, Secondary, Both.	IDE: Both
	• *Serial Port A*: Assigns control of serial port A. Options include: Enabled, Auto or Disabled. When enabled, you must also select the Base I/O Address and Interrupt for serial port A. - *Base I/O address*: - *Interrupt*:	Enabled 3F8 IRQ4
Note: Sun Fire V40z servers include a serial port B; this option does not appear for Sun Fire V20z servers.	• *Serial Port B*: Assigns control of serial port B. Options include: Enabled, Auto or Disabled. When enabled, you must also select the Base I/O Address and Interrupt for serial port B. - *Base I/O address*: - *Interrupt*:	Enabled 2F8 IRQ3
	• *Ethernet Adapter 0 MAC*: Displays the Onboard Ethernet Adapter 0 MAC address.	MAC address
	• *Ethernet Adapter 1 MAC*: Displays the Onboard Ethernet Adapter 1 MAC address.	MAC address

TABLE 2-3 BIOS Advanced Menu *(Continued)*

Menu Option	Description	Default
PCI Configuration ***Note:*** The Sun Fire V20z server has two PCI slots; the Sun Fire V40z server has seven slots.	Setup items for configuring the specific PCI device slots:	
	• *Option ROM Scan*: When disabled, the device is not bootable but is still usable under the OS. When enabled, initializes the device expansion ROM; makes device bootable.	Enabled
	• *Enable Master*: Enables or disables the selected device as a PCI bus master.	Enabled
	• *Latency Timer*: Minimum guaranteed time slice allotted for bus master in units of PCI bus clocks. Options include: 0040h, 0060h, 0080h, 00A0h, 00C0h, 00E0h, default and 0020h.	0040h
	Setup items for configuring the Embedded Broadcom device GBIT 0 or GBIT 1:	
	• *Option ROM Scan*: When disabled, the device is not bootable but still usable under the OS. When enabled, initializes device expansion ROM; makes device bootable.	Enabled
	Reserve specific IRQs for use by legacy ISA devices:	
	• *PCI/PNP IRQ Exclusion*: Reserves the specified IRQ for use by legacy ISA devices.	Available
	• *PCI/PNP UMB Exclusion*: Reserves the specified block of upper memory for use by legacy ISA devices.	Available
Note: This option is new in NSV v2.2.0.x	*Option ROM Expansion*: If errors occur when option ROMs are initialized, choose Extended to increase memory during ROM expansion time. ***Caution:*** The server may hang when Extended is used with some option ROMs.	Normal
Note: This option is new in NSV v2.2.0.x	*8131 Errata 56 PCLK*: This indicates a card problem. The BIOS will fix the problem or will turn it off. If you select Enabled, the BIOS will not turn it off.	Disabled

TABLE 2-3 BIOS Advanced Menu *(Continued)*

Menu Option	Description	Default
Console Redirection	Additional setup to configure console. Options include:	
	• *COM port address*: If enabled, the console uses a port on the motherboard. Options include: Disabled, On-board COM A, On-board COM B.	On-board COM A
	• *Console connection*: Indicates whether the console is connected directly to the system or through a modem. Options include: Direct and Modem.	Direct
	• *Baud rate*: Enables the specified baud rate. Options include: 300, 1200, 2400, 9600, 19.2K, 38.4 K, 57.6K, 115.2 K.	9600
	• *Flow control*: Enables flow control. Options include: None, XON/XOFF, CTS/RTS.	None
	• *Console type*: Enables the specified console type. Options include: VT100, VT100 8 bit, ANSI 7 bit, ANSI, VT100 plus, UTF8.	vt100 plus
	• *Continue CR after POST*: Normally, console redirection is off before the OS loads. Set this item to On to troubleshoot the BIOS boot problems. Note: the OS loader typically interrupts console redirection once it starts. Options include: On and Off.	On

2.4.3 Security Menu

TABLE 2-4 shows the options that are available from the BIOS Security menu.

TABLE 2-4 BIOS Security Menu

Menu Option	Description	Default
Supervisor Password Is:	Displays whether a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.	Clear
User Password Is:	Displays whether a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.	Clear
Set Supervisor Password	Supervisor password controls access to the Setup Utility. Enter the Supervisor's password to set or change it. Enables access to BIOS.	Enter
Set User Password	Enter the user's password to set or change it. Enables access to the system at boot time.	Enter
Password on Boot	Allows you to require a password to be entered when the system boots. Options include: Enabled (password required) and Disabled (password not required).	Disabled
Fixed Disk Boot Sector	May offer protection against viruses when set to Write Protect, which protects the boot sector on the hard drive from having a virus written to it. Options include: Write Protect and Normal.	Normal

2.4.4 Power Menu

TABLE 2-5 shows the options that are available from the BIOS Power menu.

TABLE 2-5 BIOS Power Menu

Menu Option	Description	Default
Resume on Time	Wakes the system up at the specified time. Options are On or Off.	Off
Resume Time	If turned on, specifies the time you want the system to wake up.	00.00.00
Resume Date	If turned on, specifies the date you want the system to wake up.	00/00/0000
After Power Failure	Sets the mode of operation if an AC power loss occurs. Three modes are available: - Stay off: returns the system to an off state. - Power on: returns the system to a full on state. - Last state: returns the server to the state it was at before the power went off.	Stay off

2.4.5 Boot Menu

TABLE 2-6 shows the options that are available from the BIOS Boot menu. To change the order of the boot items, select an item and press the plus (+) key to move the item up in the order and the minus (-) key to move the item down in the order.

TABLE 2-6 BIOS Boot Menu

Menu Option	Description	Default Boot Order
Removable Devices (Floppy)	Boot from the diskette drive	First boot device
CD-ROM Drive	Boot from the CD/DVD-ROM	Second boot device
Hard Drive	Boot from the hard disk	Third boot device
Network Boot	Boot from a networked device	Networked boot device
MBA v7.0.*x* Slot 0210	Boot from the on-board NIC #1	Fourth boot device
MBA v7.0.*x* Slot 0218	Boot from the on-board NIC #2	Fifth boot device

2.4.6 Exit Menu

TABLE 2-7 shows the options that are available from the BIOS Exit menu.

TABLE 2-7 BIOS Exit Menu

Menu Item	Description
Exit Saving Changes	Exit System Setup and save changes to CMOS.
Exit Discarding Changes	Exit System Setup without saving changes.
Load Setup Defaults	Load defaults for all setup items.
Discard Changes	Load previous values from CMOS for all setup items.
Save Changes	Save setup data to CMOS.

2.4.7 QuickBoot Feature

The QuickBoot feature, which disables BIOS memory tests, defaults to disabled, which is the recommended setting.

Note – If you choose to set Quickboot to enabled, you need to perform the following steps to disable the QuickBoot feature whenever you add new memory, so that the new memory configuration can be tested.

---

1. **Boot the server and run BIOS Setup by pressing the F2 key during the boot process.**
2. **From the Advanced menu, disable the QuickBoot feature.**

   Now the BIOS will run at least one full memory test for your new memory when the server is rebooted.
3. **Press F10 to save the changes and exit.**

   The system will automatically reboot and run the memory configuration tests.
4. **When all memory passes the tests, press the F2 key to enter BIOS Setup and re-enable the QuickBoot option in the BIOS Advanced menu, if needed.**

2.5 Booting From a USB Diskette Device

Only one diskette device is bootable on these servers. By default, the internal diskette device is the only device from which you can boot.

To change the assignment of the diskette devices so that the server boots from a USB diskette device, rather than the internal diskette device, perform the following steps:

1. **Attach the USB diskette device.**
2. **Power on and reboot the system.**
3. **Press the F2 key to enter the BIOS Setup utility.**
4. **From the Advanced menu, choose I/O Device Configuration.**
5. **Change the USB Host Controller and USB BIOS Legacy Support submenu options to Enable.**
6. **Press the F10 key to save your changes and reboot the server.**
7. **When prompted, press the F2 key to enter the BIOS Setup utility.**
8. **In the Boot menu, select Removable Devices.**
9. **Select USB Floppy from the Removable Devices submenu, and press the plus (+) key to move USB Floppy to the top of the list of devices.**
10. **Press the F10 key to save your changes and reboot.**

    The USB diskette device is bootable as drive A. If left enabled, the internal diskette drive becomes drive B and is not bootable.

Note – To change the internal diskette drive to be drive A again, disconnect the USB diskette device and reboot the server. The internal diskette device will be assigned to drive A, and if you reattach the USB diskette device, it will be assigned to drive B.

CHAPTER 3

Maintaining the Sun Fire V20z Server

This chapter describes how to add, replace and configure components in the Sun Fire V20z and V40z servers server after it has been set up.

Caution – Before touching or replacing any component inside the server, disconnect all external cables. If possible, place the server on a grounded electrostatic-discharge (ESD) pad and ALWAYS wear a properly grounded, antistatic wrist strap.

For instructions on maintaining a Sun Fire V40z server, see Chapter 4.

This chapter contains the following sections:

- "Tools and Supplies Needed" on page 3-1
- "Powering Off the Server and Removing the Cover" on page 3-2
- "Releases of the Sun Fire V20z Server" on page 3-5
- "Locations of Sun Fire V20z Components" on page 3-4
- "Customer-Replaceable-Unit Replacement Procedures" on page 3-12
- "Sun Fire V20z Indicators, Switches and Jumpers" on page 3-44

To determine and isolate a faulty component, refer to the *Sun Fire V20z and Sun Fire V40z Servers—Troubleshooting Techniques and Diagnostics Guide* (817-7184).

3.1 Tools and Supplies Needed

- #2 crosshead screwdriver
- Antistatic wrist strap
- Alcohol pads (for CPU replacement only)

3.2 Powering Off the Server and Removing the Cover

Perform this procedure to observe safety guidelines when you are powering off the system and removing the cover for a maintenance procedure in this chapter:

1. **If the system OS is running, perform a shutdown of the OS, then press and release the platform power button on the front panel.**
2. **Turn off all peripheral devices connected to the system.**
3. **Turn off the AC power switch on the rear panel of the server (see** FIGURE 1-2**). Disconnect the server from the electrical outlet.**
4. **Turn off power to any attached peripherals.**
5. **Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back panel of the system.**

Caution – The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

6. **Before handling components, attach a wrist strap to a chassis ground (any unpainted metal surface).**
7. **Pull the cover toward the server front slightly, then press the cover latch release button with your right thumb (A) and slide the cover towards the rear of the chassis until it contacts the stop (B) (see** FIGURE 3-1**).**
8. **Lift the cover up and remove it.**

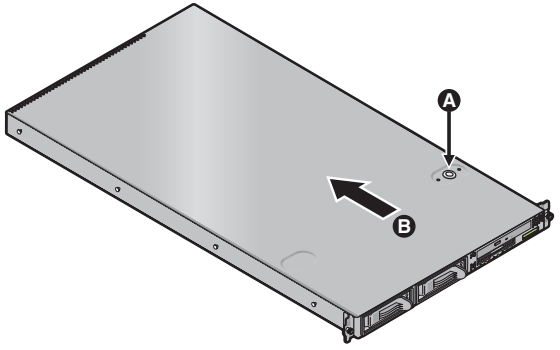

FIGURE 3-1 Removing the Cover of the Sun Fire V20z Server

3.2.1 Server Top-Cover Installation

When replacing the top cover on the Sun Fire V20z server after component installation, use caution to avoid damaging the cover or server components.

Remove all peripheral cables from PCI cards before installing the cover. If you install the server cover with PCI card cables installed, a lip on the edge of the server cover and the EMC foam gasket inside that lip may catch parts of the PCI card connectors and, in some cases, may deform the server cover seal or damage the connector latches.

Ensure that the power-supply cable is properly installed. The server cover may not close properly or may be difficult to close, and server performance may be affected if the power-supply cable is not properly installed.

The power-supply cable must be routed and pressed down such that it does not interfere with the cover installation. The power-supply cable must be tucked into a position such that the cable and its associated tie-wraps are not below the top surface of the power supply. Rotate the tie-wraps downward so that they do not protrude above the cable itself.

3.3 Locations of Sun Fire V20z Components

Refer to FIGURE 3-2 to locate components before performing the remove and replace procedures.

The following figure indicates the location of each of these components:

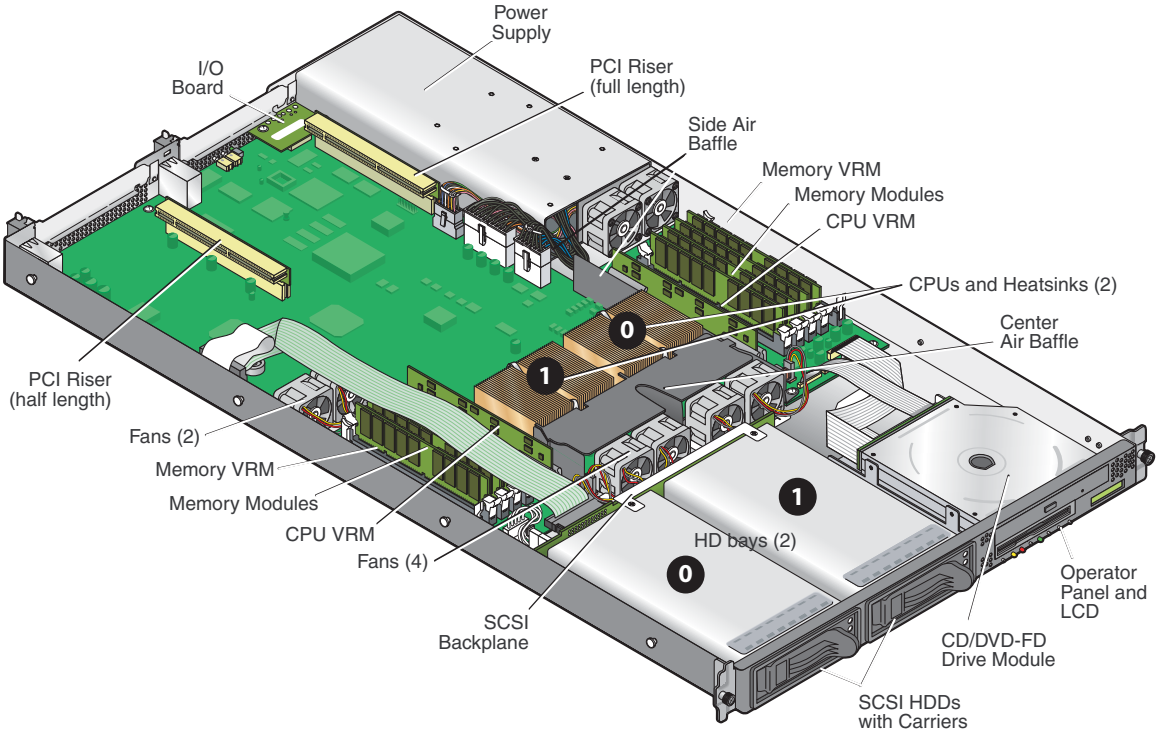

FIGURE 3-2 Locations of System Components in Sun Fire V20z Server, Top-Down View

3.3.1 SCSI ID Assignments

The ID assignments for the SCSI hard-disk-drive connectors on the SCSI backplane are shown in FIGURE 3-3, when viewing the HDDs from the front of the server.

- SCSI slot 0 is the left drive bay.
- SCSI slot 1 is the middle drive bay, next to the CD-ROM/Diskette Drive assembly.

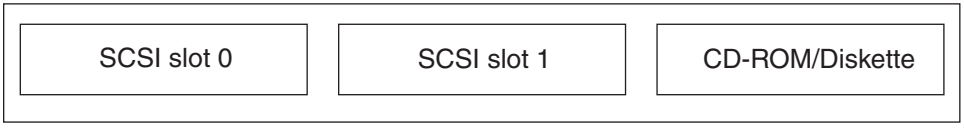

FIGURE 3-3 SCSI Slot Numbering for HDDs

3.3.1.1 Linux-based Server

If you have a single SCSI HDD, the drive can be inserted in either slot. If you have two HDDs, the drive with the OS boot sector must be installed in the lowest-numbered slot among the populated slots.

3.3.1.2 Solaris-based Server

The Solaris boot disk must be installed in SCSI slot 0.

3.4 Releases of the Sun Fire V20z Server

This chapter applies to:

- the original release (chassis part number [PN] **380-0979**) of the server
- the first updated release (chassis PN **380-1168**) of the server
- the second updated release (chassis PN **380-1194**) of the server

The following sections highlight some issues that you should take into account when performing the remove-and-replace procedures in this chapter.

3.4.1 Versions of the Sun Fire V20z Server

A number of different versions of the Sun Fire V20z server have been released. Due to changes on the motherboard as well as in the BIOS and firmware, a number of components—such as memory VRMs and CPU VRMs—are not interchangeable among the various releases.

The chassis part number (PN) is labelled on the front panel of the server, near the CD-ROM/DVD-ROM/Diskette Drive assembly.

TABLE 4 explains the components available for each of the server releases.

TABLE 4 Components Available for Server Releases

Super FRU Chassis PN	Family of CPU (stepping version)	CPU VRM required (PN)	Type of Memory DIMM	Memory VRM required (PN)
380-0979	C0	F370-6680	DDR 333	F370-6646
380-1168	CG	F370-6680	DDR 333	F370-6646
380-1194	E	F370-7746	DDR 333 DDR 400	F370-7747

3.4.1.1 Important Information

Please take note of the following items.

Super FRU chassis PN 380-0979 (Sun Fire V20z server)

For this release:

- Super FRU chassis PN F380-0979 is sent as a replacement for chassis PN 380-0979 only.
- You can only use CPU stepping version C0.
- You can only use Registered DDR 333 memory DIMMs.

Super FRU chassis PN 380-1168 (Sun Fire V20z server)

For this release:

- Super FRU chassis PN F380-1168 is sent as a replacement for chassis PN 380-1168. If necessary, it can be sent as a replacement for chassis PN 380-0979.
- You can use CPU stepping versions C0 and CG in this Super FRU replacement. To use stepping version CG, the server must be running BIOS version 1.27.9 or higher.
- You cannot use CPU stepping version E in this release.
- You can only use Registered DDR 333 memory DIMMs.

Super FRU chassis PN 380-1194 (Sun Fire V20z server)

For this release:

- Super FRU chassis PN F380-1194 is sent as a replacement for chassis PN 380-1194 only.
- You can only use CPU stepping version E.
- You cannot use CPU stepping versions C0 and CG.
- With CPU stepping version E, you must use the CPU VRM PN F370-7746 (due to the higher wattage requirements for this CPU).
- You can use Registered DDR 333 or DDR 400 memory DIMMs.
- In this Super FRU release, you must use the memory VRM PN F370-7747, due to the higher speed of the DIMMs. This is the supported memory VRM for this Super FRU, and it covers both the DRR 333 and DDR 400 memory DIMMs.

3.4.1.2 Solaris 9 OS Install-Time Update for a Super-FRU Replacement

If you want to install the Solaris™ 9 Operating System (OS) on an updated release of the Sun Fire V20z server (either chassis PN 380-1168 or PN 380-1194), you must download a Solaris OS Install-Time Update (ITU) from the Web site. This ITU is required during OS installation.

If you want to install the Solaris 9 OS on an updated release of the Sun Fire V40z server, you must also download this Solaris OS ITU from the Web site. This ITU is required during OS installation.

The Solaris OS ITU is available from the product Web site:

`http://www.sun.com/servers/entry/v20z/downloads.html`

3.4.2 No Mixing of CPU Stepping Versions

A number of different versions of the Sun Fire V20z server have been released with CPUs of different stepping versions.

If you order an CPU X-option to add or replace a CPU in your server, do not mix CPUs of different stepping versions.

Caution – A new heatsink ships for the stepping version "E" CPU. Ensure that you do not use an old heatsink on a stepping version "E" CPU.

Before ordering a new or replacement CPU, verify the stepping version of your CPU(s) and then order the same stepping version.

Due to the power requirements and height restrictions, the stepping version "E" CPUs work only in the Sun Fire V20z server release PN 380-1194.

In a two-CPU configuration of the Sun Fire V20z server, both CPUs must be the same stepping version and the same speed.

3.4.2.1 Verifying the Stepping Version of the CPU

You can verify the stepping version of the CPU in a local server or on a remote server.

Verifying the Stepping Version In a Local Server

To verify the stepping version of your CPU(s) in a local server (with KVM attached):

1. **Power on or reboot your server.**

   A message similar to the following example appears on the screen, and the memory test begins.

   This sample shows the output for a Sun Fire V20z server.

```
-----------------
PhoenixBIOS 4.0 Release 6.0
Copyright 1985-2002 Phoenix Technologies Ltd.
All Rights Reserved
Production RELEASE: System BIOS Revision = V1.30.5
SP Interface (PRS) Revision = 92
SP - BIOS Interface Active

xxxxxxxxxxxxxxxxxxxxxxxxx
xx   Sun Microsystems   xx
xx     Sun Fire V20z    xx
xxxxxxxxxxxxxxxxxxxxxxxxx

CPU = AMD Opteron(tm) Processor 250
2 Processors Detected, CG - CG
PCIX - Slot1: PCIX-66     Slot2: PCIX-133
4031M System RAM Passed
1024K Cache SRAM Passed
ATAPI CD-ROM: CD-224E
Mouse initialized
-------------------------
```

2. **During the memory test, hit the Pause key.**

3. **Verify the stepping version of the CPUs in the line similar to the following examples:**

```
2 Processors Detected, CG - CG
```

   or

```
2 Processors Detected, E4 - E4
```

4. **To continue with the reboot, hit any key.**

Verifying the Stepping Version In a Remote Server

To verify the stepping version of your CPU(s) in a remote server:

1. **Enable the Serial-Over-Lan(SOL) feature on the SP.**

   For more information, refer to the "Serial Over LAN" section in Chapter 4 of the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide* (817-5249).

2. **Launch an SOL session from a SP command-line interface (CLI) to connect to the platform console remotely.**

3. **Run the following command.**

   `platform set console -s sp -e -S` *baud rate*

   where *baud rate* is the value that you have set in the BIOS settings; the default baud rate in the BIOS settings is 9600.

   For example, if the baud rate in your BIOS settings is set to the default value, you would enter:

   `platform set console -s sp -e -S 9600`

   Note – This command changes the baud-rate value for the SP so that it matches the baud rate in the BIOS settings. It does not change the baud rate in the BIOS settings.

   ---

4. **Run the following command.**

   `platform get console`

5. **Verify that the correct baud rate appears in the Speed column. Using the example above, the output should appear as follows:**

   ```
   Rear Panel Console Redirection   Speed   Pruning   Log Trigger
   SP Console Enabled               9600    No        244 KB
   ```

6. **Activate the SOL session by running the following command.**

   `platform console`

7. **Create another SP session from the SP prompt.**

8. **Re-cycle the power on the platform OS by running the following command.**

   Note – Before you re-cycle the power, ensure that the platform OS has been shut down gracefully, or that the file system has been synchronized using the `sync` command.

   `platform set power state cycle -W -f`

9. **In the SP SOL session that you launched in Step 1, you now see the output of the BIOS CPU step screen.**

   For a sample of this output, see Step 1 in the previous procedure on page 3-9.

10. **During the server's memory self-test, terminate the remote session in order to pause the screen:**

    a. Press Control-e.

    b. Press the 'c' key.

    c. Press the period key (.).

11. **Verify the stepping version of the CPUs in the line similar to the following examples:**

    ```
    2 Processors Detected, CG - CG
    ```

    or

    ```
    2 Processors Detected, E4 - E4
    ```

3.4.3 Support Guide for Half-Length PCI Card Removed

In the original release of the Sun Fire V20z server, there is a plastic guide on the motherboard for supporting a half-length PCI-X card. This support guide prevents you from installing a full-length PCI-X card in the PCI 1 (66 MHz) position.

In the updated releases of the server, the guide has been removed. You can now install a full-length PCI-X card in this slot.

3.5 Customer-Replaceable-Unit Replacement Procedures

Caution – Before touching or replacing any component inside the server, disconnect all external cables. If possible, place the server on a grounded electrostatic-discharge (ESD) pad and ALWAYS wear a properly grounded, antistatic wrist strap.

The following components are customer-replaceable units (CRUs):

- I/O Board (see "I/O Board" on page 3-13)
- PCI Card(s) and Risers (see "PCI Card" on page 3-14)
- SCSI Hard Disk Drive(s) and Carriers (see "SCSI Hard Disk Drive and Carrier" on page 3-16)
- SCSI Backplane (see "SCSI Backplane" on page 3-18)
- CD-ROM/DVD/Diskette Assembly (see "CD-ROM/DVD-ROM/Diskette Drive Assembly" on page 3-21)
- Operator-Panel Board and LCD Assembly (see "Operator-Panel Board and LCD Display" on page 3-23)
- Power Supply (see "Power Supply" on page 3-24)
- Fans (see "Cooling Fans" on page 3-26)
- Memory Voltage-Regulator Modules (see "Memory Voltage-Regulator Modules" on page 3-28)
- CPU Voltage-Regulator Modules (see "CPU Voltage-Regulator Modules" on page 3-29)
- Memory (see "Memory Modules" on page 3-31)
- Battery (see "System Battery" on page 3-34)
- Cable Kit (see "Cable Kit" on page 3-35)
- CPU(s) (see "CPUs and Heatsinks" on page 3-37)
- Super FRU (chassis swap) (see "Super-FRU" on page 3-42)

Note – Removing the battery causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS setup.

Note – If a CRU needs replacement, you can request a replacement part from Sun. All parts replaced under warranty must be returned to Sun within 30 days of receipt of the replacement part.

3.5.1 I/O Board

Follow these steps to remove and replace the I/O board:

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Remove the two screws securing the I/O board to the motherboard (see** FIGURE 3-5**).**

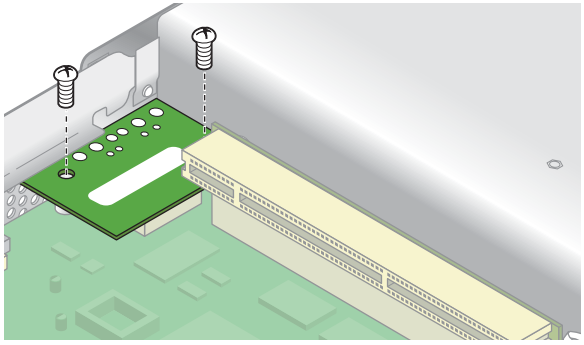

FIGURE 3-5 Removing the I/O Board

3. **Lift the I/O board straight up to free it from the connector on the motherboard.**

   Installation is the reverse of this procedure.

Note – When re-installing the I/O board, ensure that the connector on the I/O board is seated in the corresponding connector on the motherboard.

---

4. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.2 PCI Card

Caution – Do not use +5 V PCI cards or you may cause damage to the motherboard. Use only +3 V PCI cards in your Sun Fire V20z and V40z servers.

3.5.2.1 Supported PCI Cards

For the current list of PCI cards that are supported for the Sun Fire V20z and Sun Fire V40z servers, visit `http://www.sun.com/servers/entry/v20z/optioncards.html`.

This page also contains links to third-party Web sites for further information on each of the cards.

3.5.2.2 Adding or Replacing a PCI Card

The following procedure describes how to add or replace a PCI card.

Note – Before installing or replacing a PCI card, refer to the following guidelines: If you are using the onboard NICs and one PCI card, install the PCI card in the right (full-length) slot, looking from the front of the server. On the back panel, this is slot PCI 0; refer to FIGURE 1-2.

If you are using the onboard NICs and two PCI cards, install the faster PCI card in the right (full-length) slot and the slower card in the left (half-length) slot (PCI 1 on the back panel). If you are not using the onboard NICs, install a half-length card in the left (half-length) slot and a full-length card in the right (full-length) slot.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

To Remove an Existing PCI Card

1. **Unfasten all cables connected to the card.**
2. **Withdraw the card and riser from the PCI card connector on the motherboard.**
3. **Remove the PCI card from the riser.**

Note – If the PCI card is being removed, but not replaced with another card: Re-install the empty riser assembly in the empty PCI-card connector on the motherboard. Re-install the PCI-card slot cover.

To Install a New PCI Card

1. **Loosen the screw holding the card latch.**
2. **Raise the latch as far as possible and then pivot it towards the rear of the chassis.**
3. **Withdraw the PCI card slot cover (see** FIGURE 3-6**).**

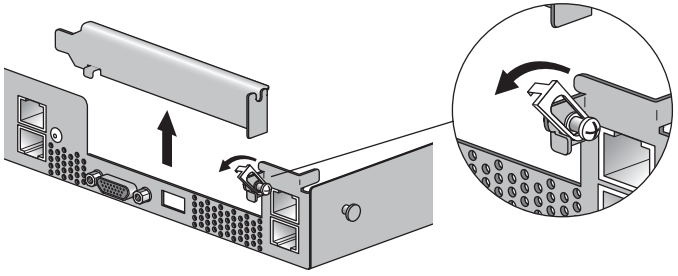

FIGURE 3-6 PCI Card Slot Cover

4. **Remove the card riser assembly from the PCI card connector on the motherboard.**
5. **Install the PCI card in the riser assembly (see** FIGURE 3-7**).**
6. **Re-install the riser and card in the connector on the motherboard.**

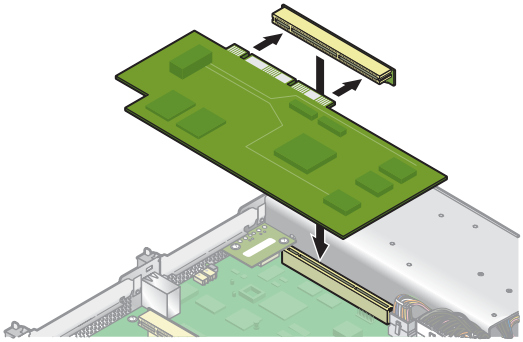

FIGURE 3-7 PCI Card and Riser

7. **Pivot the card latch up and then slide it down until it captures the PCI card bracket. Tighten the screw to secure the latch (refer to** FIGURE 3-6**).**

8. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.3 SCSI Hard Disk Drive and Carrier

The following procedure describes how to remove and replace a SCSI hard disk drive (HDD) and carrier.

Note – SCSI HDDs are hot-pluggable in integrated-mirroring (IM) configurations. See "Integrated Mirroring" on page D-2 for more information.

See also "SCSI ID Assignments" on page 3-5.

3.5.3.1 Removing an HDD and Carrier

1. **If you are *not* using an integrated-mirroring configuration, you must power off the server before removing a HDD; it is not necessary to remove the cover. Power off the system as described in "Powering Off the Server and Removing the Cover" on page 3-2.**

   If you are using an IM configuration, start with Step 2.

2. **Squeeze the release latch and carefully swing the arm to the left as far as it will go (see** FIGURE 3-8**).**

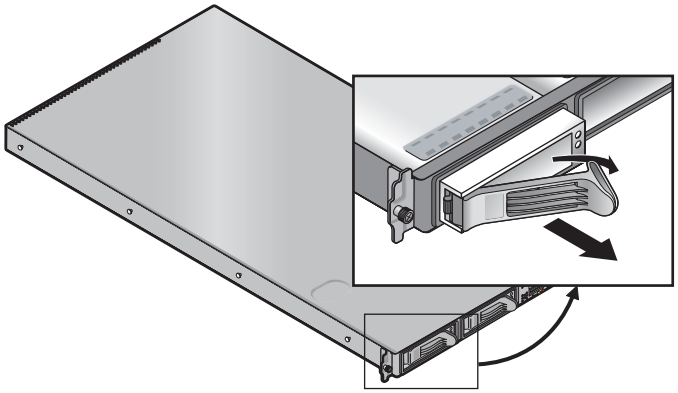

FIGURE 3-8 SCSI Hard Disk Drive Carrier and Release Latch

3. **Grasp the carrier bezel with both hands and carefully pull the carrier out of the drive bay.**

Note – Avoid using the arm to remove the carrier.

3.5.3.2 Installing an HDD and Carrier

1. **Squeeze the release latch and carefully swing the arm to the left as far as it will go.**
2. **Grasping the body of the drive in both hands, carefully guide the connector end of the carrier into the drive bay, sliding the carrier into the bay until the arm engages and partially closes itself.**
3. **Push the arm forward and latch it to lock the carrier in place.**

3.5.4 SCSI Backplane

The following procedure describes how to replace the SCSI backplane.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Remove all hard disk drive (HDD) carriers:**

   a. **Squeeze the release latch and swing the arm to the left as far as it will go.**

   b. **Grasp the carrier bezel with both hands and carefully pull the carrier out of the drive bay (see** FIGURE 3-9**).**

Note – Avoid using the arm to remove the carrier.

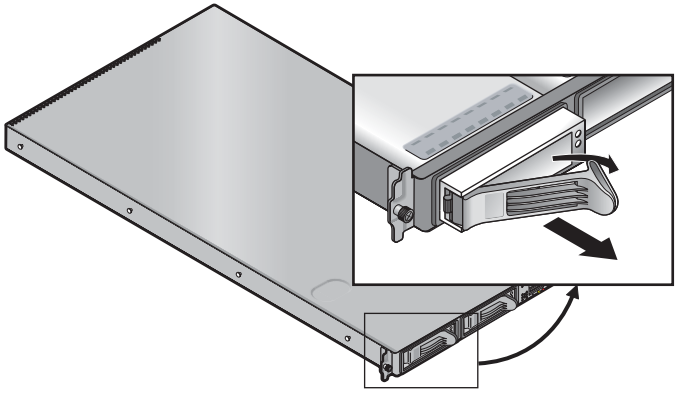

FIGURE 3-9 SCSI HDD Carrier and Release Latch

3. **Remove screw that holds the center air baffle and remove the baffle from the server (see** FIGURE 3-10**).**

FIGURE 3-10 Removing the Center Air Baffle

4. **Remove the second processor fan from the right (see** FIGURE 3-11**):**

   a. **Unplug the fan's power connector from the motherboard.**

   b. **Pull the fan straight up to remove it from the fan tray.**

Note – Note exactly which motherboard connector to which the fan was connected. If you plug a fan back into an incorrect connector, the SP cannot correctly identify a fan failure.

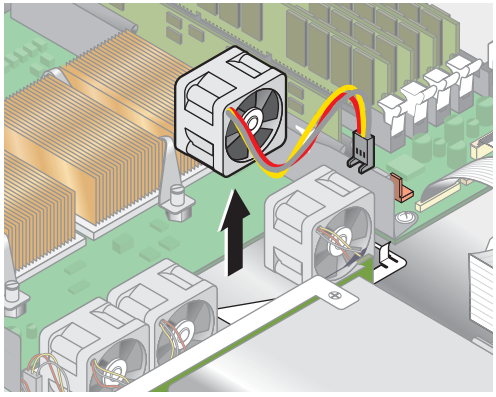

FIGURE 3-11 Removing a Cooling Fan

5. **Remove the CPU VRM for CPU 1 (left-hand CPU) by pulling it straight up, out of its sockets (see** FIGURE 3-12**).**

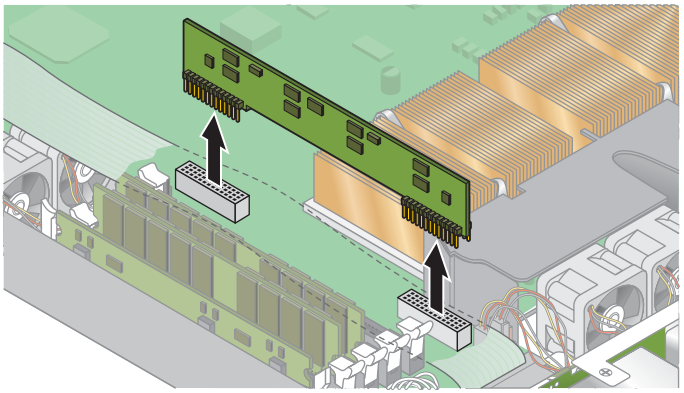

FIGURE 3-12 Removing the CPU 1 VRM

6. **Disconnect the 5-pin power cable, the small, flat cable and the 68-pin ribbon signal cable from the SCSI backplane (see** FIGURE 3-13**).**

Caution – Use care with the small flat cables. They are extremely fragile.

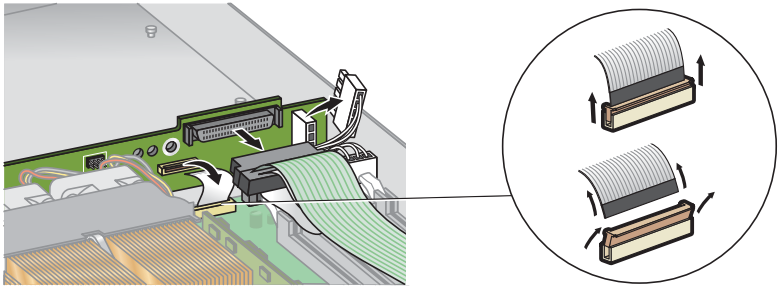

FIGURE 3-13 Uncabling the SCSI Backplane

7. **Unfasten the two screws that secure the backplane to the chassis.**
8. **Lift the SCSI backplane up and out of the chassis (see** FIGURE 3-14**).**

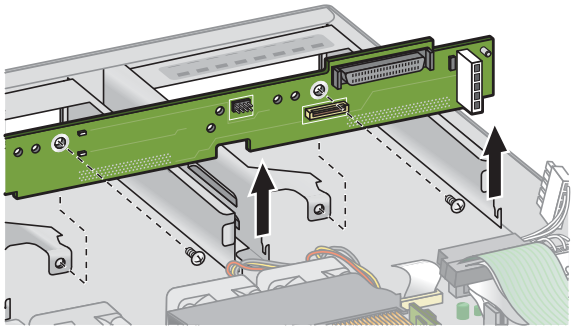

FIGURE 3-14 Removing the SCSI Backplane

Caution – Ensure that the fan wires are not pinched when reinstalling the backplane.

9. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.5 CD-ROM/DVD-ROM/Diskette Drive Assembly

The following procedure describes how to replace the CD-ROM/DVD-ROM/Diskette Drive assembly.

Note – Removable drives are fragile components that must be handled with care. To prevent damage to the system, damage to a removable drive, or loss of information, observe these precautions: Before removing a diskette drive or CD-ROM/DVD-ROM drive, be sure that a diskette or disc is not in the drive. Be sure that the CD-ROM/DVD-ROM tray is closed. While handling a drive, avoid touching the connector.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Unfasten the CD-ROM/DVD-ROM/Diskette Drive ribbon cables from the motherboard (see** FIGURE 3-15**).**

Caution – Use care with the small flat cables. They are extremely fragile.

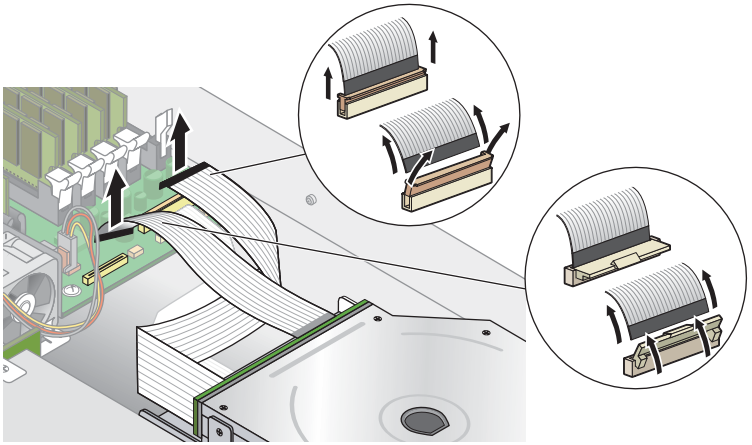

FIGURE 3-15 Uncabling the CD-ROM/DVD-ROM/Diskette Drive Assembly

3. **Unfasten the single screw securing the CD-ROM/DVD/Diskette drive assembly to the chassis (see** FIGURE 3-16**).**

4. **Slide the assembly towards the rear of the chassis approximately 0.5″ (12mm).**

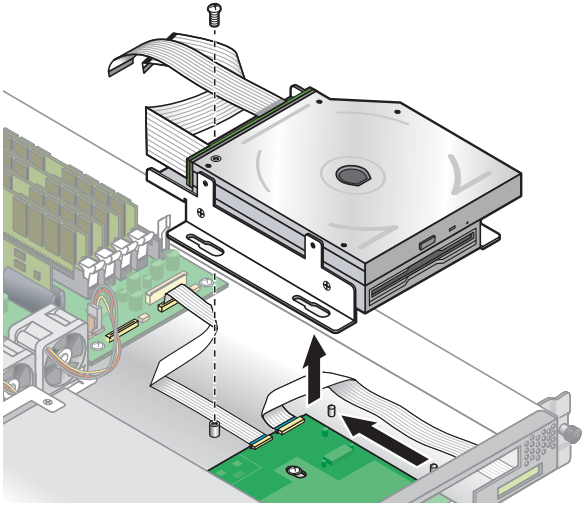

FIGURE 3-16 Removing the CD-ROM/DVD-ROM/Diskette Drive Assembly

Caution – Move the assembly by grasping it by its sides. Do not to push on the CD-ROM/DVD-ROM tray.

5. **Lift the rear of the assembly slightly and withdraw it from the chassis.**
6. **Disconnect the ribbon cables from the rear of the asssembly.**

   You will re-use these ribbon cables when you install a new assembly.
7. **Installation is the reverse of this procedure.**
8. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.6 Operator-Panel Board and LCD Display

The following procedure describes how to replace the operator-panel board and liquid crystal display (LCD). The operator-panel board is located beneath the CD-ROM/DVD/diskette drive assembly.

1. **Power off the system and remove the cover as described in "Powering Off the Server and Removing the Cover" on page 3-2.**
2. **Remove the CD-ROM/DVD/diskette drive assembly (see "CD-ROM/DVD-ROM/Diskette Drive Assembly" on page 3-21).**
3. **Remove the two screws securing the LCD to the front panel (see** FIGURE 3-17**).**

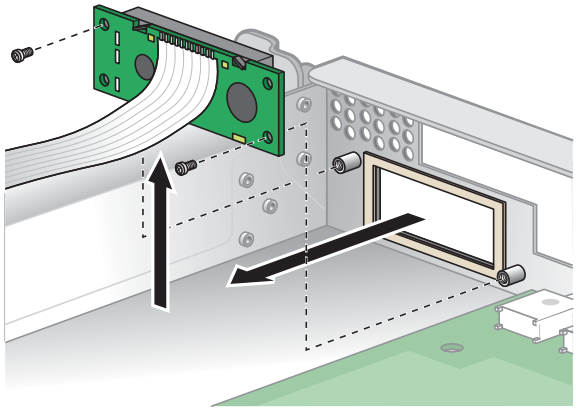

FIGURE 3-17 Removing the LCD

4. **Unfasten the ribbon cable connecting the operator-panel board to the motherboard (see** FIGURE 3-18**).**

Caution – Use care with the small, flat cables. They are extremely fragile.

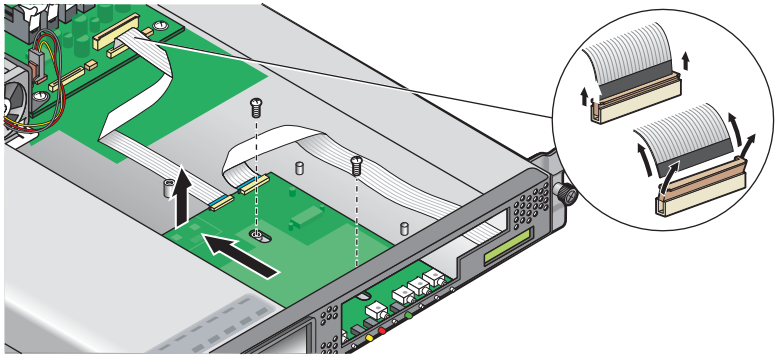

FIGURE 3-18 Uncabling and Removing the Operator-Panel Board

5. **Remove the two screws and washers mounting the operator-panel board to the chassis (see** FIGURE 3-18**).**

6. **Carefully slide the operator-panel board towards the rear of the chassis as far as possible, to avoid damaging the switches. Raise the rear edge of the board first, and then lift the operator-panel board and LCD out of the chassis.**

   Installation is the reverse of this procedure.

7. **Check the routing of all cables for obstructions and then reinstall the cover.**

3.5.7 Power Supply

The following procedure describes how to replace the power supply.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Unfasten the three screws that secure the center and side air baffles. Lift the baffles straight up to remove them (see** FIGURE 3-19**).**

FIGURE 3-19 Removing the Center and Side Air Baffles

3. **Disconnect the three power-supply cables from the motherboard (see** FIGURE 3-20**).**

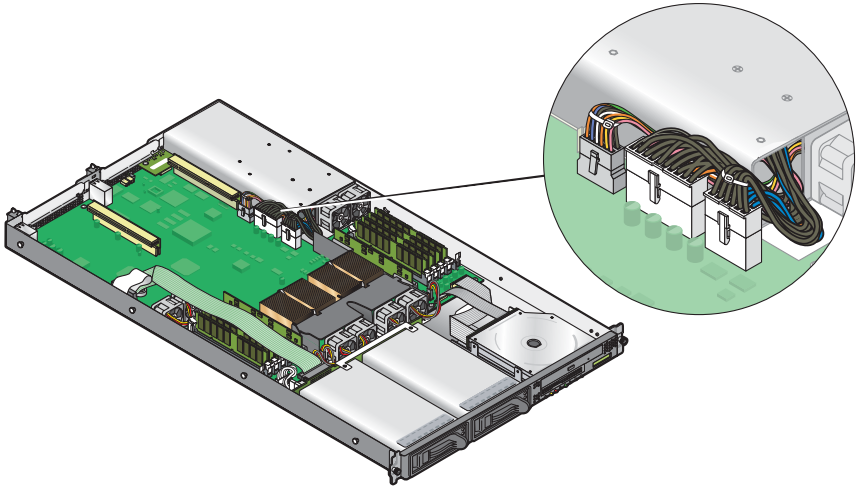

FIGURE 3-20 Disconnecting the Power-Supply Cables

4. **Unfasten the single screw securing the power supply to the rear of the chassis (see** FIGURE 3-21**).**

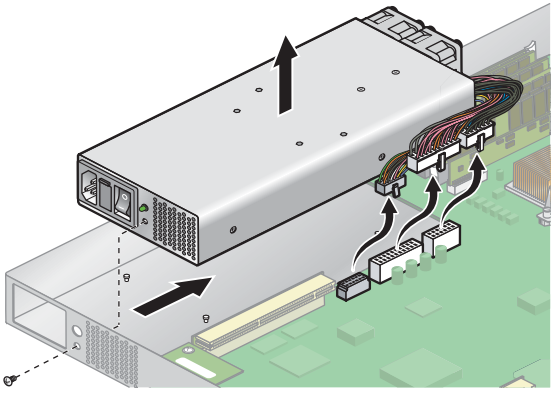

FIGURE 3-21 Removing the Power Supply

5. **Slide the power supply toward the front of the chassis and lift it out of the chassis.**

   Installation is the reverse of this procedure.

6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.8 Cooling Fans

The following procedure describes how to replace a cooling fan.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Identify the fan(s) to be replaced.**

3. **If you are replacing a processor cooling fan, unfasten the single screw securing the center air baffle and lift the baffle away from the chassis (see** FIGURE 3-22**). Otherwise, continue with Step 4.**

FIGURE 3-22 Removing the Center Air Baffle

4. **Unplug the fan's power connector from the motherboard (see** FIGURE 3-23**).**

Note – Note exactly which motherboard connector to which the fan was connected. If you plug a fan back into an incorrect connector, the SP cannot correctly identify a fan failure.

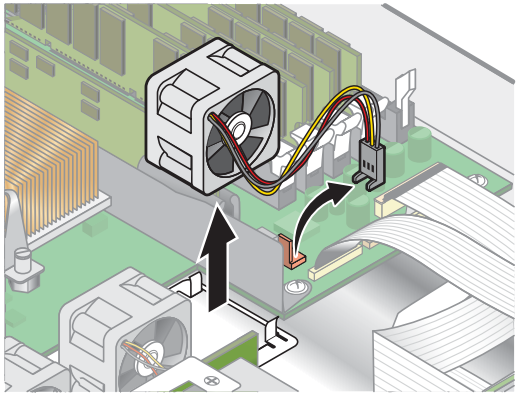

FIGURE 3-23 Removing the Cooling Fans (Processor Fan Shown

5. **Pull the fan straight up to remove it from the fan tray.**

Installation is the reverse of this procedure.

Caution – Ensure that the fan airflow direction is correct (front to rear) by installing the fan so that the airflow direction arrow points towards the rear of the chassis. After installing a new fan, allow sufficient time for the system to recognize the fan and to determine whether it is functioning properly.

6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.9 Memory Voltage-Regulator Modules

The following procedure describes how to replace a memory voltage-regulator module (VRM).

Caution – The Registered DDR 400 memory DIMMS can only be used in the second updated release (chassis part number [PN] 380-1194) of the Sun Fire V20z server.

If you are installing the new Registered DDR 400 memory DIMMs in your server, you must also install the new 2.6V voltage-regulator module (VRM) (PN 370-7747).

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Identify the memory VRM that must be replaced.**

   The memory VRM is in the outer slot, furthest from the CPU.

3. **Remove a memory VRM by pressing down on the ejector bars at both ends of the socket (see** FIGURE 3-24**).**

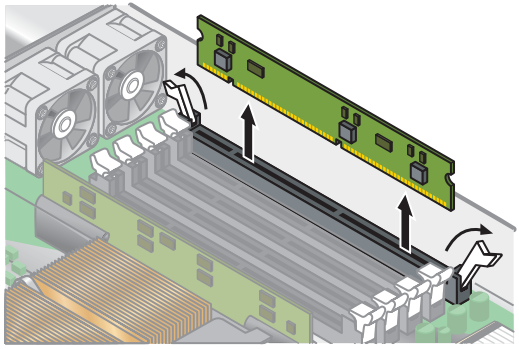

FIGURE 3-24 Removing a Memory VRM

Installation is the reverse of this procedure.

4. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.10 CPU Voltage-Regulator Modules

The following procedure describes how to remove and replace a CPU voltage-regulator module (VRM).

3.5.10.1 Before You Start

This procedure covers the original release of the Sun Fire V20z server (chassis part number [PN] 380-0979), the first updated release (chassis PN 380-1168) and the second updated release (chassis PN 380-1194) .

- The CPU VRM for the second updated release (chassis PN 380-1194) has more pins than the CPU VRM for the original release and the first updated release. These VRMs are **not** interchangeable.
- The CPU VRM for the original release of the Sun Fire V20z server can also be used in the first updated release of the server, as well as in the original release of the Sun Fire V40z server (chassis PN 380-1010).
- The CPU VRM for the second updated release of the Sun Fire V20z server can also be used in the updated release of the Sun Fire V40z server (chassis PN 380-1206).

3.5.10.2 Removing a CPU VRM

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Identify the CPU VRM that must be replaced.**

   The CPU VRM is in the inner slot, closest to the CPU.

3. **Remove the CPU VRM by pulling it *straight up*, out of its socket (see** FIGURE 3-25**).**

Caution – To avoid damaging the VRM, do not rock the VRM from side to side when removing or inserting it. Instead, pull straight up on both ends when removing the VRM and push straight down on both ends when inserting it.

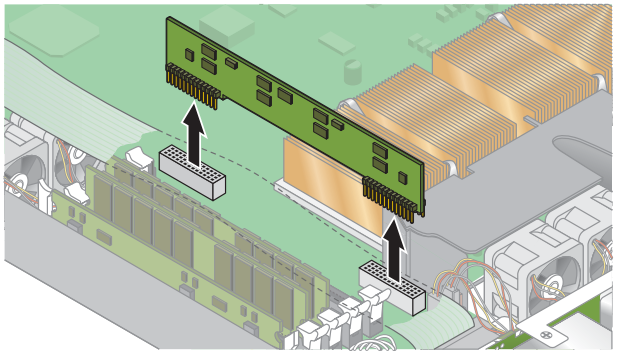

FIGURE 3-25 Removing a CPU VRM

3.5.10.3 Replacing a CPU VRM

Caution – When installing a VRM, ensure that pin "A1", on the VRM, is aligned with the "A1" reference designation on the motherboard.

1. **Press the new VRM into the empty socket until it snaps into place, ensuring that the key in the CPU VRM aligns with the key in the connector.**

2. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.11 Memory Modules

The following procedure describes how to remove and replace memory modules.

3.5.11.1 Memory Module Population Rules

Use the following information and rules when you use the procedures in this section to replace or add dual inline memory modules (DIMMs) to the server.

- DIMMs used in the server must all be of the same type: “Registered DDR 333" or “Registered DDR 400".

Caution – The Registered DDR 400 memory DIMMS can only be used in the second updated release (chassis part number [PN] 380-1194) of the Sun Fire V20z server.

If you are installing the new Registered DDR 400 memory DIMMs in your server, you must also install the new 2.6V voltage-regulator module (VRM) (PN 370-7747).

Note – If you mix two different types of DIMM, the memory clocks down to the lower speed. Sun Microsystems, Inc. does not support this configuration.

Note – A maximum of 6 GB of memory per CPU is currently supported in the Sun Fire V20z server at DDR 400 speed: two 2-GB DIMMs and two 1-GB DIMMS. In this case, you must insert the 2-GB DIMMs in the bank next to the CPU and the 1-GB DIMMs in the outer bank.

If more than 6 GB of DDR 400 memory is installed per CPU (meaning, 2-GB DIMMs in all four memory slots), the system will access at the memory only at DDR 333 speed.

- Four DIMMs are supported per CPU. The four DIMM slots for each CPU are grouped into two banks (bank 0 and bank 1) that contain two slots each.
- The Sun Fire V20z server supports either one- or two-CPU configurations. In a one-CPU system, you can only use the four DIMM slots that are adjacent to CPU0.
- In a two-CPU system, each CPU can use two or four DIMMs; when using only two DIMMs for a CPU, populate the bank closest to the CPU first (bank 0).
- DIMMs must be installed in matched pairs (one bank at a time). The two DIMMs in a bank must be of the same size, type and vendor.

- Each CPU can support two banks of DIMMs. While each bank must contain a pair of matching DIMMs, the size and vendor of the DIMMs between bank 0 and bank 1 do not have to match.
  - For example, TABLE 3-1 shows some valid sample configurations for CPU0. In each example, DIMM 0 and DIMM 1 match in size (and vendor), but they do not have to match DIMM 2 and DIMM 3. DIMM 2 and DIMM 3 must match within their bank, but they do not have to match DIMM 0 and DIMM 1.

TABLE 3-1 Sample of Valid DIMM Configurations

CPU 0	BANK 0	BANK 1
Example 1	DIMM 0 = 512, DIMM 1 = 512	DIMM 2 = 1GB, DIMM 3 = 1GB
Example 2	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 1GB, DIMM 3 = 1GB
Example 3	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 512
Example 4	DIMM 0 = 2GB, DIMM 1 = 2GB	DIMM 2 = 512, DIMM 3 = 512

- The sample configurations in TABLE 3-2 are *not* valid because in each case, at least one of the banks contains mismatched DIMM pairs.

TABLE 3-2 Sample of Non-Valid DIMM Configurations

CPU 0	BANK 0	BANK 1
Example 1	DIMM 0 = 512, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 512
Example 2	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 2GB
Example 3	DIMM 0 = 2GB, DIMM 1 = 2GB	DIMM 2 = 512, DIMM 3 = 1GB
Example 4	DIMM 0 = 512, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 1GB

3.5.11.2 Removing a memory module

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Locate the memory-module connector in which you will install or replace a memory module.**

3. **Remove a memory module by pressing down on the ejector bars at both ends of the memory module's socket (see** FIGURE 3-26**).**

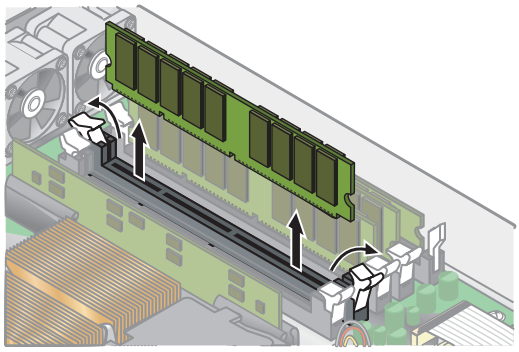

FIGURE 3-26 Removing a Memory Module

3.5.11.3 Installing a Memory Module

1. **Ensure that the memory-module socket's ejectors are open (rotated outward) to allow the new module to be inserted.**

2. **Align the memory module's edge connector with the alignment key and insert the memory module into the connector.**

Note – The manufacturer and capacity of both modules in a given memory bank must be identical.

---

3. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.12 System Battery

The system battery is a common CR2032 calculator battery.

You might need to replace the system battery if you know it is weak or if after any period of AC power loss, the BIOS loses its CMOS settings or if the time-of-day clock loses time.

Note – The server BIOS will be reset to factory settings when you replace the battery.

Caution – Do not attempt to open or service batteries. The battery contains lithium and can explode if not properly used, handled or disposed of.

3.5.12.1 Removing the System Battery

1. **Power off the system and remove the cover as described in "Powering Off the Server and Removing the Cover" on page 3-2.**
2. **Remove the system battery by sliding it back and prying it from the holder (see** FIGURE 3-27 **for the location).**

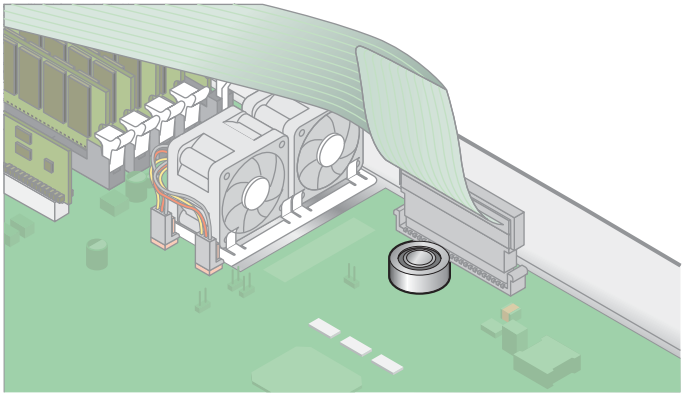

FIGURE 3-27 Removing the System Battery

Caution – Do not dispose of the battery with regular waste. Discard used batteries according to the manufacturer's instructions or contact your local waste-disposal agency for the location of the nearest battery deposit site.

3.5.12.2 Replacing the System Battery

1. **Install the new system battery into the holder with the side labeled "+" facing up.**

Note – Replace the battery only with the identical model.

---

2. **Check the routing of all cables for obstructions and then reinstall the cover.**

3.5.13 Cable Kit

The following procedure describes how to remove and replace the following cables:

- Five-pin power cable connecting the SCSI backplane to the motherboard (1).
- 68-pin ribbon cable connecting the SCSI backplane to the motherboard (2).
- Flat cable connecting the SCSI backplane to the motherboard (3).
- Flat cable connecting the operator-panel board to the motherboard (4).
- Flat cable connecting the CD-ROM/DVD to the motherboard (5).
- Flat cable connecting the Diskette Drive to the motherboard (6).

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Identify the cable to be replaced (see** FIGURE 3-28 **for the location).**

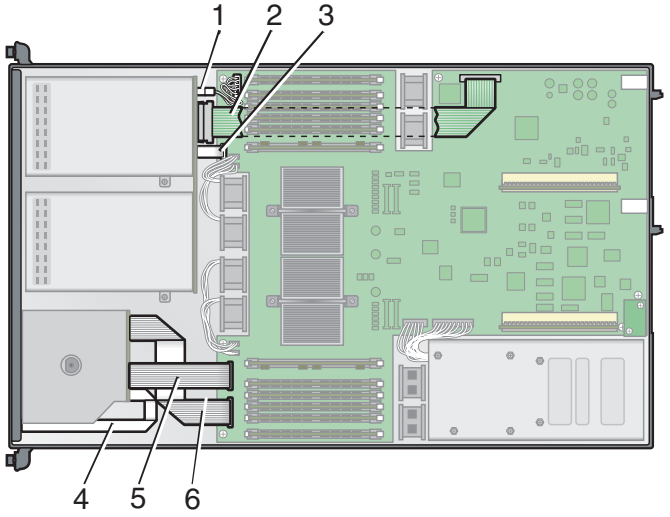

FIGURE 3-28 System Cables in the Sun Fire V20z Server

- The two halves of the 5-pin SCSI backplane power cable connector (1) are secured with a hook.
- The 68-pin SCSI ribbon cable (2) has no locking mechanism.
- The small, flat cables (3, 4, 5 and 6) are attached using two different types of zero-insertion-force (ZIF) cable connectors. Because of their small size, it may be difficult to distinguish one connector type from the other.

Refer to FIGURE 3-29 for the methods used to release cables from the various types of connectors.

3. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

Caution – Use caution when removing cables because they are fragile—the small, flat, flexible cables and cable connectors are extremely sensitive.

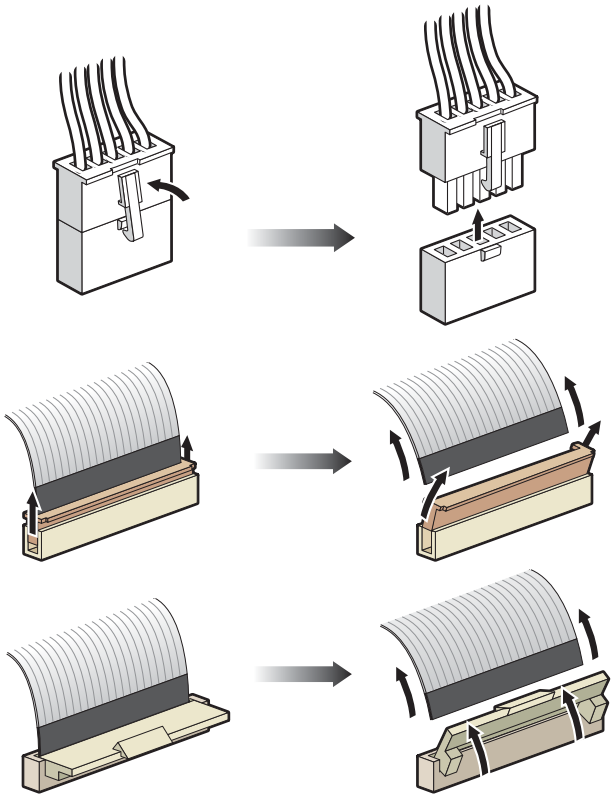

FIGURE 3-29 Types of Cable Connector

3.5.14 CPUs and Heatsinks

Caution – In a two-CPU configuration of the Sun Fire V20z server, both CPUs must be the same stepping version and the same speed. Before adding or replacing a CPU, ensure that you have read the information in "No Mixing of CPU Stepping Versions" on page 3-8.

The Sun Fire V20z server supports both one- and two-CPU configurations. The following procedure describes how to replace a CPU.

3.5.14.1 One-CPU Configuration

For a Sun Fire V20z server, if you are changing from a two-CPU configuration to a one-CPU configuration:

1. Install the single CPU in the CPU0 connector.
2. Remove CPU1.
3. Remove the CPU VRM for CPU1.

   If the CPU VRM for CPU1 is installed with no CPU in the CPU1 connector, the server will not boot.
4. Remove the memory DIMMS and the memory VRM for CPU1.

   If CPU1 is not installed, CPU0 does not see the memory DIMMs in the slots for CPU1.

3.5.14.2 Removing a Heatsink and CPU

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.
2. **Unfasten the single securing screw and remove the center air baffle (see** FIGURE 3-30**).**

FIGURE 3-30 Removing the Center Air Baffle

3. **Unscrew the heatsink from the motherboard.**

   a. **For a heatsink installed in the original release (chassis PN 380-0979) and the first updated release (chassis PN 380-1168) of the Sun Fire V20z server (for CPUs of stepping versions "C0" and "CG"):**

      Unfasten the two securing screws and remove the heatsink securing clip. **See** FIGURE 3-31**.**

   b. **For a heatsink installed in the second updated release (chassis PN 380-1194) of the server (for CPUs of stepping versions "E"):**

      Loosen the screws evenly on each side of the heatsink. Remove the screws and captive springs that secure the heatsink (the washers remain fixed to the surface of the heatsink). See FIGURE 3-32.

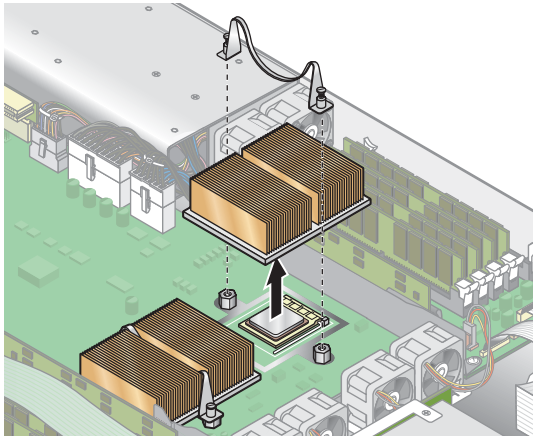

FIGURE 3-31 Removing The Securing Clip and Heatsink for Stepping Versions "C0" and "CG" CPUs

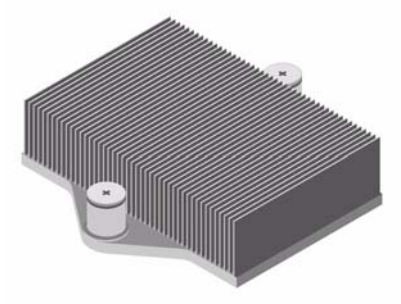

FIGURE 3-32 Heatsink for Stepping Version "E" CPU

Caution – The heatsink can become extremely hot. Be sure it has had sufficient time to cool before handling.

4. **Twist the heatsink slightly to the right or left to break the seal with the thermal grease.**
5. **Lift the heatsink away from the CPU.**
6. **Use an alcohol pad to remove all thermal grease from the bottom of the heatsink.**

   Be careful not to get any thermal grease on your fingers. It is very sticky and you may contaminate other components when handling them.

7. **Place the heatsink upside-down on a flat surface to prevent the thermal grease from contaminating other components.**
8. **Pull the socket release lever up to the fully open, perpendicular position (see** FIGURE 3-33**).**
9. **Lift the CPU out of the socket, leaving the release lever in the open position.**

Caution – Ensure that any thermal grease that might remain from the heatsink does not come into contact with the CPU socket or pins.

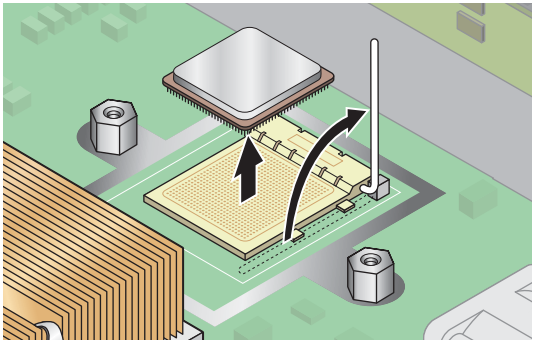

FIGURE 3-33 Removing a CPU from its Socket

3.5.14.3 Installing a CPU and Heatsink

1. **Unpack the new CPU.**

Caution – Observe the appropriate ESD precautions.

2. **Ensure that the socket release lever is in the fully open, perpendicular position (see** FIGURE 3-34**).**
3. **Align the small triangle, on the corner of the CPU, with the triangle on the corner of the socket.**

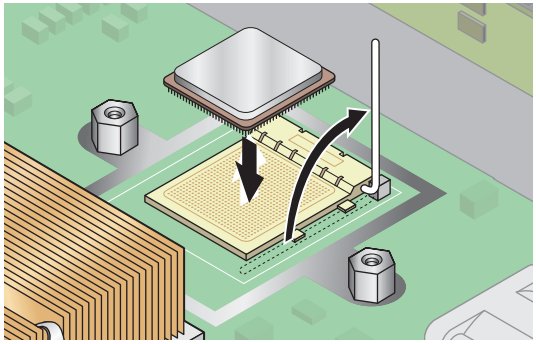

FIGURE 3-34 Installing a CPU in its Socket

4. **Insert the CPU into the socket.**

Caution – If correctly aligned, the CPU should easily insert into the socket. If more than minimal resistance is felt, stop and recheck the alignment. Forcing a misaligned CPU into the socket will permanently damage the device.

---

5. **When the CPU is fully seated in the socket, rotate the socket release lever down until it snaps into place, securing the CPU in the socket.**
6. **Use the syringe to apply approximately 0.1 ML/CC of thermal grease in a circular pattern to the top of the CPU.**
7. **Gently distribute the thermal grease and remove any excess so that only an extremely thin, uniform layer remains. If any voids or crevices appear that could lead to air pockets, reapply the grease until you achieve a thin but compact consistency.**
8. **Inspect the heatsink for dust and lint. Clean again if necessary.**
9. **Ensure the foam strip under the heatsink area is intact and has not been removed, loosened or damaged. This foam strip is critical to proper air flow.**
10. **Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.**

Caution – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

---

11. **According to the type of heatsink that you have, after the heatsink is correctly aligned:**

    a. **Re-install the heatsink clips so that the longer tab points toward the fans.**

    b. **Tighten the clip-securing screws.**

    OR

Caution – Tighten the screws evenly on each side of the heatsink. If you completely tighten the screw on one side first, you may damage the CPU underneath.

    a. **Re-insert the screws and captive springs.**

    b. **Tighten the screws.**

12. **Replace the center air baffle.**

13. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

3.5.15 Super FRU

Caution – Only a qualified technician is allowed to perform this procedure. This package is not a customer-replaceable unit (CRU).

Refer to the Service Label, on the inside of the chassis cover, for the location of the components.

The Super FRU is a chassis containing the motherboard and certain customer-replaceable units (CRUs). To install a Super FRU, you must remove all of the CRUs from the old chassis. Then, re-install each of those components in the new Super FRU chassis.

Note – The Sun Fire V20z Super FRU ships with the Operator-Panel Board/LCD assembly and the six cooling fans installed. You do not need to remove these items from your old chassis.

You must remove all other CRUs from your old chassis and re-install them in the new chassis. This includes the system cables.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 3-2.

2. **Remove the following components and re-install them in the new Super FRU chassis.**

   Refer to the appropriate instructions in this chapter to remove and replace each component. Also refer to FIGURE 3-2 for component locations.

   - I/O Board (see "I/O Board" on page 3-13)
   - PCI Card(s) and Risers (2) (see "PCI Card" on page 3-14)
   - Hard Disk Drive (1-2) and Carrier (2) (see "SCSI Hard Disk Drive and Carrier" on page 3-16)
   - SCSI Backplane (see "SCSI Backplane" on page 3-18)
   - CD-ROM/DVD-ROM/Diskette Drive Assembly (see "CD-ROM/DVD-ROM/Diskette Drive Assembly" on page 3-21)
   - Power Supply (see "Power Supply" on page 3-24)
   - Memory VRMs (1-2) (see "Memory Voltage-Regulator Modules" on page 3-28)
   - CPU VRMs (1-2) (see "CPU Voltage-Regulator Modules" on page 3-29)
   - Memory Modules (1-8) (see "Memory Modules" on page 3-31)
   - System Cables (see "Cable Kit" on page 3-35)
   - CPUs and Heatsinks (1-2) (see "CPUs and Heatsinks" on page 3-37)

Note – You must also remove the center air baffle (with the part-number label) from the system being repaired and install it in the Super FRU chassis. The part-number label contains important information about the components in your particular system.

3.6 Sun Fire V20z Indicators, Switches and Jumpers

3.6.1 Sun Fire V20z Motherboard

FIGURE 3-35 shows the locations of the indicators, switches and jumpers on the motherboard. The tables in this section give detailed information about these components.

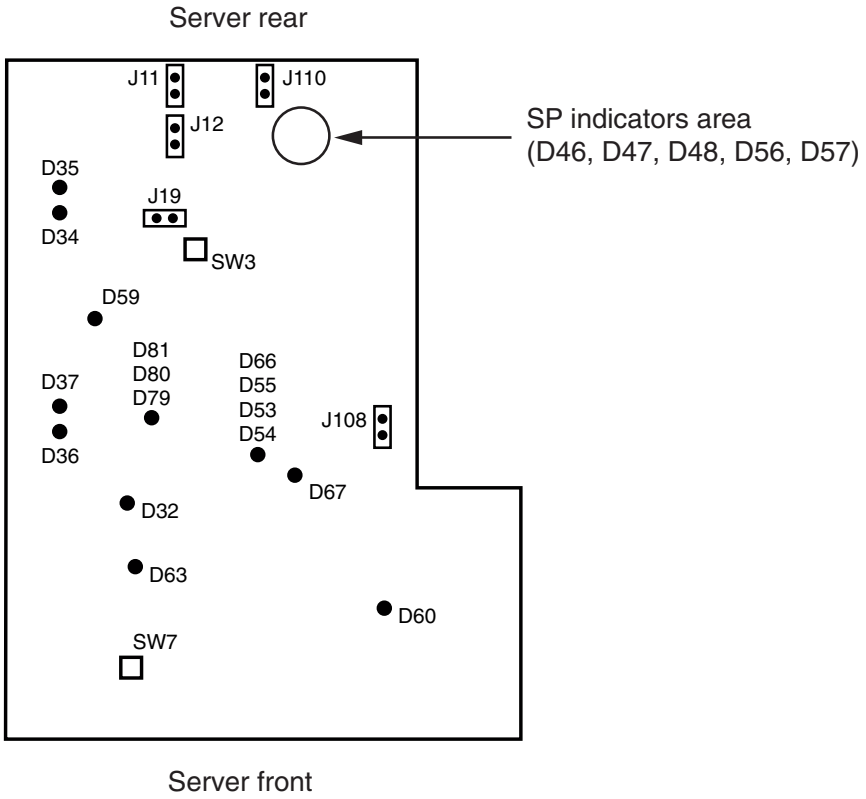

FIGURE 3-35 Sun Fire V20z Motherboard, Showing Jumper Locations

TABLE 3-3 defines the functions of the switches and jumpers shown in FIGURE 3-35.

TABLE 3-3 Switches and Jumpers

Component	Function or Definition
SW3	Alternate power on
SW7	Platform reset
J11	BIOS write-protect: Pins 1+2 = enabled, Pins 2+3 = disabled
J12	BIOS Boot block: Pins 1+2 = enabled, Pins 2+3 = disabled
J13	Reserved (not shown in figure)
J19	Serial port: Pins 1+2 = SP console, Pins 2+3 = Platform port A
J110	Clear CMOS: Pins 1+2 = clear CMOS on next boot, Pins 2+3 = retain CMOS settings on next boot
J108	NPUI Power supply: Pins 1+2 = disabled, Pins 2+3 = enabled
J105	Reserved (not shown in figure)

TABLE 3-4 defines the actions and meaning of the SP indicators shown in FIGURE 3-35.

TABLE 3-4 Service Processor Indicators

Indicator	Initialization	Run State
D46	Off, Off, Blinks twice	Stays on
D47	Off, Blinks twice	
D48	Blinks twice	Stays on
D56	Off, Off, Blinks twice	Stays on if Ethernet cable is connected to top SP port.
D57	Off, Off, Blinks twice	Stays on if Ethernet cable is connected to bottom SP port

TABLE 3-5 defines the function and meaning of the power indicators shown in FIGURE 3-35.

TABLE 3-5 Power Indicators

Indicator	Description	Color
D32	Fan in full on (error)	Red
D34	Gigabit(0) 10/100 mode	Yellow
D35	Gigabit(0) link activity	Yellow
D36	Gigabit(1) 10/100 mode	Yellow
D37	Gigabit(1) link activity	Yellow
D53	Power supply/power OK	Green
D54	Power on indicator	Green
D55	Reset indicator	Yellow/off
D59	Thor RAM power on	Green
D60	CPU 0 power OK	Green
D63	CPU 1 power OK	Green
D66	Thor power good	Green
D67	PRS internal error	Red
D79	SCSI channel A indicator	Green
D80	Reserved	Reserved
D81	SCSI controller operational	Green

3.6.2 Clear-CMOS Jumper

The location of the Clear-CMOS jumper (J110) on the Sun Fire V20z motherboard is shown below. This jumper can be used to clear the CMOS if the server hangs during certain conditions.

- The default position for the jumper is pins 2+3, which is the setting for "Clear-CMOS-Removed." This setting retains CMOS settings on each reboot of the server.
- If you move the jumper to pins 1+2, this is the "Clear-CMOS-Installed" setting. This setting will clear the CMOS settings with each reboot of the server.

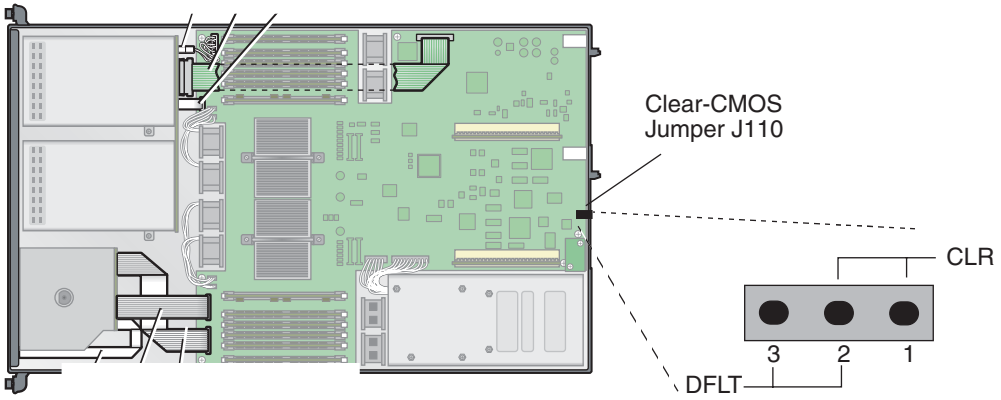

FIGURE 3-36 Sun Fire V20z Motherboard, Showing Clear-CMOS Jumper J110

CHAPTER 4

Maintaining the Sun Fire V40z Server

This chapter describes how to add, replace and configure components in the Sun Fire V40z server after it has been set up.

Caution – Before touching or replacing any component inside the server, disconnect all external cables. If possible, place the server on a grounded electrostatic-discharge (ESD) pad and ALWAYS wear a properly grounded, antistatic wrist strap.

For instructions on maintaining a Sun Fire V20z server, see Chapter 3.

This chapter contains the following sections:

- "Tools and Supplies Needed" on page 4-1
- "Powering Off the Server and Removing the Cover" on page 4-2
- "Locations of Sun Fire V40z Components" on page 4-3
- "Customer-Replaceable-Unit Replacement Procedures" on page 4-12
- "Sun Fire V40z Indicators, Switches and Jumpers" on page 4-78

To determine and isolate a faulty component, refer to the *Sun Fire V20z and Sun Fire V40z Servers—Troubleshooting Techniques and Diagnostics Guide* (817-7184).

4.1 Tools and Supplies Needed

- #2 crosshead screwdriver
- Antistatic wrist strap
- Alcohol pads (for CPU replacement only)

4.2 Powering Off the Server and Removing the Cover

Caution – Before you power on a Sun Fire V40z server for the *first time*, you must remove the packaging inserts from the server's PCI card slots and CPU card slot to ensure proper air flow and cooling. You can discard these packaging inserts, which serve as protection during shipping. Do NOT remove the plastic air-baffle inserts from the PCI slots.

The updated release (chassis part number [PN] 380-1206) of the Sun Fire V40z server does *not* ship with the packaging insert in the PCI card slots.

Perform this procedure to observe safety guidelines when you are powering off the system and removing the cover for a maintenance procedure in this chapter:

1. **Turn off all peripheral devices connected to the system.**
2. **If the system OS is running, perform a shutdown of the OS.**
3. **Disconnect all AC power cords from the rear panel of the server (see** FIGURE 1-5**).**

Caution – When you remove the AC power cords, system ground is also removed. To avoid damaging the server with electrostatic discharge (ESD), you must maintain the same voltage potential as the server.

4. **Turn off power to any attached peripherals.**
5. **Label and disconnect all peripheral cables and all telecommunication lines connected to I/O connectors or ports on the back panel of the system.**

Caution – The system's printed circuit boards and hard disk drives contain components that are extremely sensitive to static electricity.

6. **Before handling components, attach a wrist strap to a chassis ground (any unpainted metal surface).**
7. **Loosen the captive screw on the cover latch, then rotate the latch toward the system rear to push back the cover (see** FIGURE 4-1**).**
8. **Lift the cover up and remove it.**

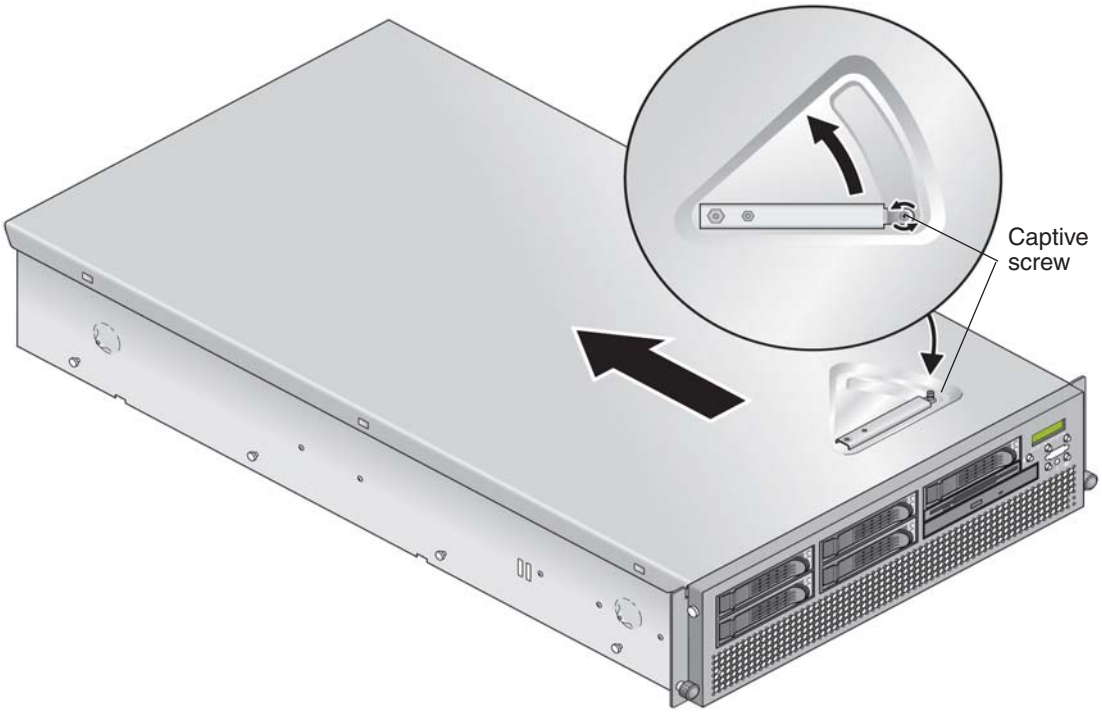

FIGURE 4-1 Removing the Cover of the Sun Fire V40z Server

4.3 Locations of Sun Fire V40z Components

Refer to FIGURE 4-2, which shows a top-down view of the server, to locate components before performing the remove and replace procedures.

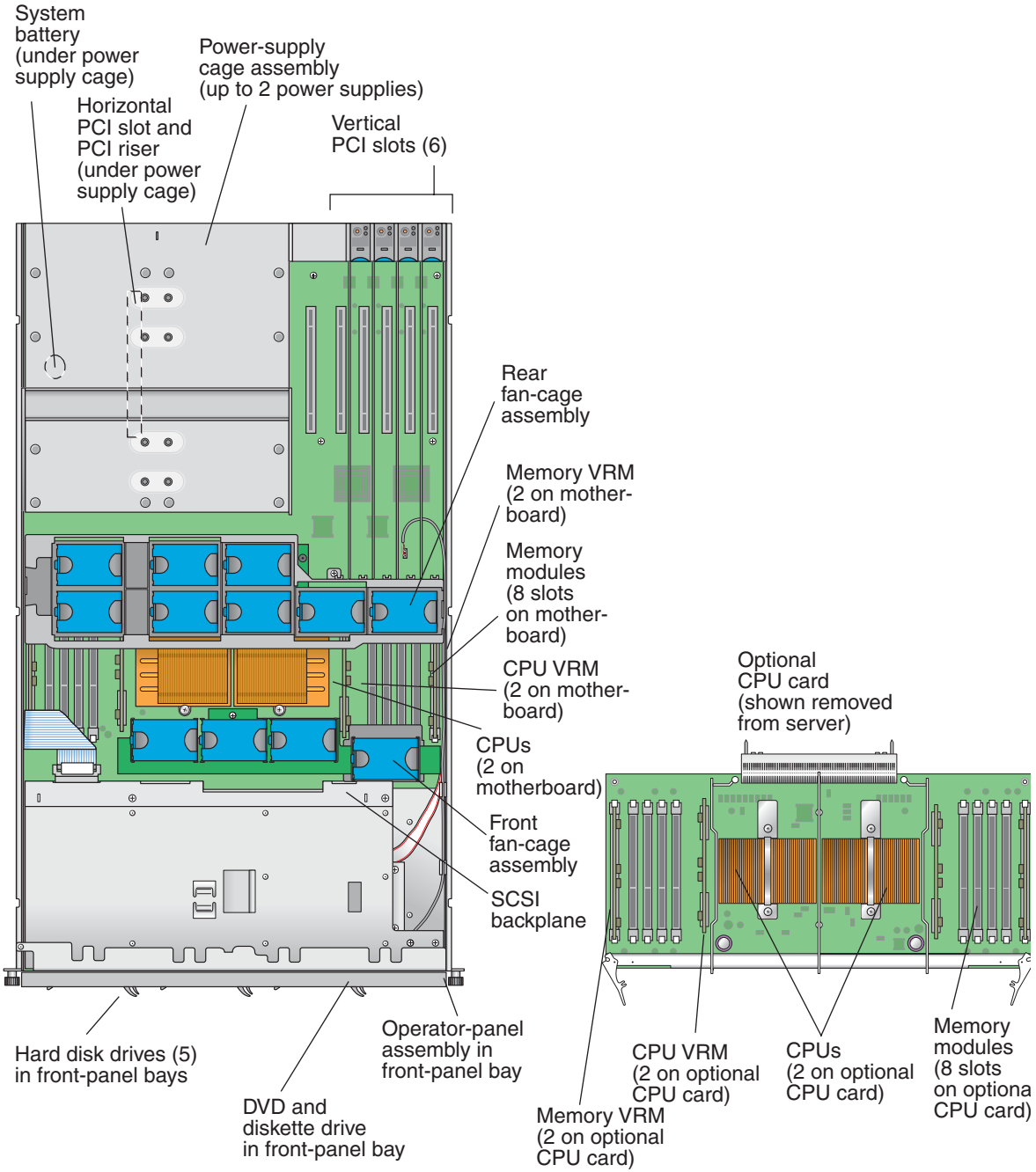
System battery (under power supply cage)
Power-supply cage assembly (up to 2 power supplies)
Horizontal PCI slot and PCI riser (under power supply cage)
Vertical PCI slots (6)
Rear fan-cage assembly
Memory VRM (2 on mother-board)
Memory modules (8 slots on mother-board)
CPU VRM (2 on mother-board)
CPUs (2 on motherboard)
Front fan-cage assembly
SCSI backplane
Optional CPU card (shown removed from server)
Hard disk drives (5) in front-panel bays
DVD and diskette drive in front-panel bay
Operator-panel assembly in front-panel bay
Memory VRM (2 on optional CPU card)
CPU VRM (2 on optional CPU card)
CPUs (2 on optional CPU card)
Memory modules (8 slots on optiona CPU card)

FIGURE 4-2 Locations of System Components in Sun Fire V40z Server, Top-Down View

4.3.1 SCSI ID Assignments

The ID assignments for the SCSI hard-disk-drive connectors on the SCSI backplane are shown in FIGURE 4-3, when viewing the HDDs from the front of the server.

If you install the optional sixth HDD adapter, SCSI slot 5 can be used for a SCSI HDD instead of a DVD-ROM/Diskette Drive assembly. For more information, see "Installing an Optional Sixth HDD and Adapter" on page 4-23.

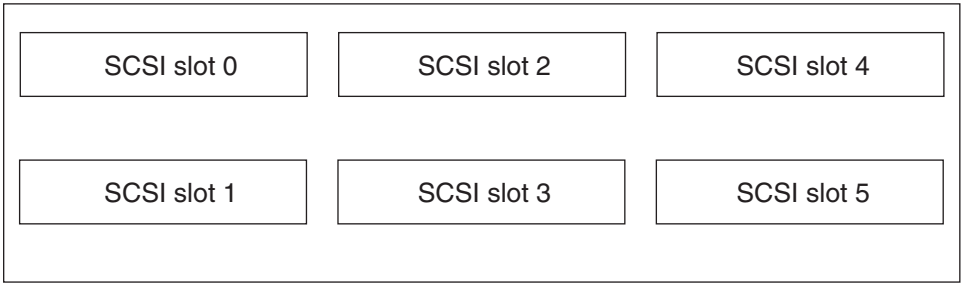

FIGURE 4-3 SCSI Slot Numbering for HDDs

4.3.1.1 Linux-based Server

If you have a single SCSI HDD, the drive can be inserted in either slot. If you have two or more HDDs, the drive with the OS boot sector must be installed in the lowest-numbered slot among the populated slots.

4.3.1.2 Solaris-based Server

The Solaris boot disk must be installed in SCSI slot 0.

4.4 Releases of the Sun Fire V40z Server

4.4.1 Versions of the Servers

An updated version of the Sun Fire V40z server has been released. Due to changes on the motherboard as well as in the BIOS and firmware, a number of components—such as memory VRMs and CPU VRMs—are not interchangeable between these releases.

The chassis part number (PN) is labelled on the front panel of the server, near the DVD-ROM/Diskette Drive assembly.

TABLE 4 explains the components available for each of the server releases.

TABLE 4 Components Available for Server Releases

Super FRU Chassis PN	Family of CPU (stepping version)	CPU VRM required (PN)	Type of Memory DIMM	Memory VRM required (PN)
380-1010	CG	F370-6680	DDR 333	F370-6646
380-1206	E	F370-7746	DDR 333 DDR 400	F370-7747

4.4.1.1 Important Information

Please take note of the following items.

Super FRU chassis PN F380-1010 (Sun Fire V40z server)

For this release:

- Super FRU chassis PN F380-1010 is sent as a replacement for chassis PN 380-1010 only.
- You can only use CPU stepping versions CG in this release.
- You cannot use CPU stepping version E.
- You can only use Registered DDR 333 memory DIMMs.

Super FRU chassis PN F380-1206 (Sun Fire V40z server)

For this release:

- Super FRU chassis PN F380-1206 is sent as a replacement for chassis PN 380-1206 only.
- You can only use CPU stepping version E.
- You cannot use CPU stepping versions C0 and CG.
- With CPU stepping version E, you must use the CPU VRM PN F370-7746 (due to the higher wattage requirements for this CPU).
- You can use Registered DDR 333 or DDR 400 memory DIMMs.
- In this Super FRU release, you must use the memory VRM PN F370-7747, due to the higher speed of the DIMMs. This is the supported memory VRM for this Super FRU, and it covers both the DRR 333 and DDR 400 memory DIMMs.

4.4.1.2 Solaris 9 OS Install-Time Update for a Super-FRU Replacement

If you want to install the Solaris™ 9 Operating System (OS) on an updated release of the Sun Fire V20z server (either chassis PN 380-1168 or PN 380-1194), you must download a Solaris OS Install-Time Update (ITU) from the Web site. This ITU is required during OS installation.

If you want to install the Solaris 9 OS on an updated release of the Sun Fire V40z server, you must also download this Solaris OS ITU from the Web site. This ITU is required during OS installation.

The Solaris OS ITU is available from the product Web site:

`http://www.sun.com/servers/entry/v40z/downloads.html`

4.4.2 No Mixing of CPU Stepping Versions

Two different versions of the Sun Fire V40z server have been released with CPUs of different stepping versions.

If you order an CPU X-option to add or replace a CPU in your server, do not mix CPUs of different stepping versions.

Caution – A new heatsink ships for the stepping version "E" CPU. Ensure that you do not use an old heatsink on a stepping version "E" CPU.

Before ordering a new or replacement CPU, verify the stepping version of your CPU(s) and then order the same stepping version.

Due to the power requirements and height restrictions, the stepping version "E" CPUs work only in the Sun Fire V40z server release PN 380-1206.

In a two- or four-CPU configuration of the Sun Fire V40z server, all CPUs must be the same stepping version and the same speed.

4.4.2.1 Verifying the Stepping Version of the CPU

You can verify the stepping version of the CPU in a local server or on a remote server.

Verifying the Stepping Version In a Local Server

To verify the stepping version of your CPU(s) in a local server (with KVM attached):

1. **Power on or reboot your server.**

   A message similar to the following example appears on the screen, and the memory test begins.

   This sample shows the output for a Sun Fire V40z server.

```
-----------------
PhoenixBIOS 4.0 Release 6.0
Copyright 1985-2002 Phoenix Technologies Ltd.
All Rights Reserved
Production RELEASE: System BIOS Revision = V2.18.9
SP Interface (PRS) Revision = 12
SP - BIOS Interface Active

xxxxxxxxxxxxxxxxxxxxxxxxx
xx   Sun Microsystems   xx
xx     Sun Fire V40z    xx
xxxxxxxxxxxxxxxxxxxxxxxxx

CPU = AMD Opteron(tm) Processor 850
4 Processors Detected, CG - CG - CG - CG
7743M System RAM Passed
1024K Cache SRAM Passed
ATAPI CD-ROM: CD-224E
Mouse initialized
-------------------------
```

2. **During the memory test, hit the Pause key.**

3. **Verify the stepping version of the CPUs in the line similar to the following examples:**

```
2 Processors Detected, CG - CG
```

   or

```
2 Processors Detected, E4 - E4
```

4. **To continue with the reboot, hit any key.**

Verifying the Stepping Version In a Remote Server

To verify the stepping version of your CPU(s) in a remote server:

1. **Enable the Serial-Over-Lan(SOL) feature on the SP.**

   For more information, refer to the "Serial Over LAN" section in Chapter 4 of the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide* (817-5249).

2. **Launch an SOL session from a SP command-line interface (CLI) to connect to the platform console remotely.**

3. **Run the following command.**

   `platform set console -s sp -e -S` *baud rate*

   where *baud rate* is the value that you have set in the BIOS settings; the default baud rate in the BIOS settings is 9600.

   For example, if the baud rate in your BIOS settings is set to the default value, you would enter:

   `platform set console -s sp -e -S 9600`

   Note – This command changes the baud-rate value for the SP so that it matches the baud rate in the BIOS settings. It does not change the baud rate in the BIOS settings.

   ---

4. **Run the following command.**

   `platform get console`

5. **Verify that the correct baud rate appears in the Speed column. Using the example above, the output should appear as follows:**

   ```
   Rear Panel Console Redirection   Speed   Pruning   Log Trigger
   SP Console Enabled               9600    No        244 KB
   ```

6. **Activate the SOL session by running the following command.**

   `platform console`

7. **Create another SP session from the SP prompt.**

8. **Re-cycle the power on the platform OS by running the following command.**

   Note – Before you re-cycle the power, ensure that the platform OS has been shut down gracefully, or that the file system has been synchronized using the `sync` command.

   `platform set power state cycle -W -f`

9. **In the SP SOL session that you launched in Step 1, you now see the output of the BIOS CPU step screen.**

   For a sample of this output, see Step 1 in the previous procedure on page 4-9.

10. **During the server's memory self-test, terminate the remote session in order to pause the screen:**

    a. **Press Control-e.**

    b. **Press the 'c' key.**

    c. **Press the period key (.).**

11. **Verify the stepping version of the CPUs in the line similar to the following examples:**

    ```
    2 Processors Detected, CG - CG
    ```

    or

    ```
    2 Processors Detected, E4 - E4
    ```

4.5 Customer-Replaceable-Unit Replacement Procedures

Caution – Before touching or replacing any component inside the server, disconnect all external cables. If possible, place the server on a grounded electrostatic-discharge (ESD) pad and ALWAYS wear a properly grounded, antistatic wrist strap.

Caution – The auxiliary CPU card is not a hot-swappable component. You must power down the server before removing the card.

Note – It is not necessary to remove the system cover when working with the CPU card. Procedures involving the CPU card can be performed with the server mounted in a rack. If it is in a rack, pull the server forward from the rack about 3 inches (76 mm) to provide clearance before opening the CPU card door.

The following components are customer-replaceable units (CRUs):

- PCI Card(s) and PCI riser (see "PCI Card" on page 4-13)
- Hard Disk Drives and Carriers (see "SCSI Hard Disk Drive and Carrier" on page 4-21)
- DVD/Diskette Drive Assembly (see "DVD-ROM/Diskette Drive Assembly" on page 4-24)
- CPU Card (optional) (see "CPU Card" on page 4-25)
- Operator panel and LCD assembly (see "Operator Panel and LCD Assembly" on page 4-29)
- SCSI Backplane Assembly (see "SCSI Backplane Assembly" on page 4-30)
- Cooling Fans (see "Replacing an Individual Cooling Fan" on page 4-32)
- Front fan-cage assembly (see "Replacing the Front Fan-Cage Assembly" on page 4-34)
- Rear fan-cage assembly (see "Replacing the Rear Fan-Cage Assembly" on page 4-35)
- Power Supplies (see "Replacing an Individual Power Supply" on page 4-37)
- Power-Supply Cage Assembly (see "Replacing a Power-Supply Cage Assembly" on page 4-39)
- Memory VRMs (on motherboard and CPU card) (see "Memory Voltage-Regulator Modules" on page 4-41)

- CPU VRMs (on motherboard and CPU card) (see "CPU Voltage-Regulator Modules" on page 4-44)
- Memory Modules (on motherboard and CPU card) (see "Memory Modules" on page 4-49)
- CPUs and Heatsinks (on motherboard and CPU card) (see "CPUs and Heatsinks" on page 4-53)
- System battery (see "System Battery" on page 4-63)
- Cables (see "Cable Kit" on page 4-65)
- Super CRU (see "Super FRU" on page 4-76)

Caution – The Sun Fire V40z server weighs 80 pounds (36.3 kilograms). Use caution when lifting or moving the server to avoid personal injury. Always load a rack from the bottom up and load the heaviest item in the rack first.

Note – Removing the battery causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS setup.

Note – If a CRU needs replacement, you can request a replacement part from Sun. All parts replaced under warranty must be returned to Sun within 30 days of receipt of the replacement part.

4.5.1 PCI Card

Caution – Do not use +5 V PCI cards or you may cause damage to the motherboard. Use only +3 V PCI cards in your Sun Fire V40z server.

4.5.1.1 Supported PCI Cards

For the current list of PCI cards that are supported for the Sun Fire V20z and Sun Fire V40z servers, visit `http://www.sun.com/servers/entry/v20z/optioncards.html`.

This page also contains links to third-party Web sites for further information on each of the cards.

4.5.1.2 Adding or Replacing a PCI Card

The following procedures describe how to add or replace a PCI card. The seven PCI card slots are comprised of four different types of slots on the Sun Fire V40z server (see FIGURE 4-5):

- Four full-length, 133 MHz/64-bit, vertical slots
- One full-length, 100 MHz/64-bit, vertical slot
- One half-length, 100 MHz/64-bit, vertical slot
- One half-length, 66MHz/64-bit, horizontal slot (with PCI riser)

Note – Each slot is capable of providing 25 watts maximum power.

On the updated release (chassis PN 380-1206) of the Sun Fire V40z server, a plastic air-baffle cage has been added around the vertical PCI slots and is attached to the motherboard by four screws. When adding or removing a PCI card, you do not need to remove the air-baffle cage.

The air-baffle cage replaces the individual plastic air-baffle inserts that are found in the original release (chassis PN 380-1010) of the server.

4.5.1.3 Sun Fire V40z Server PCI Card Slot Locations

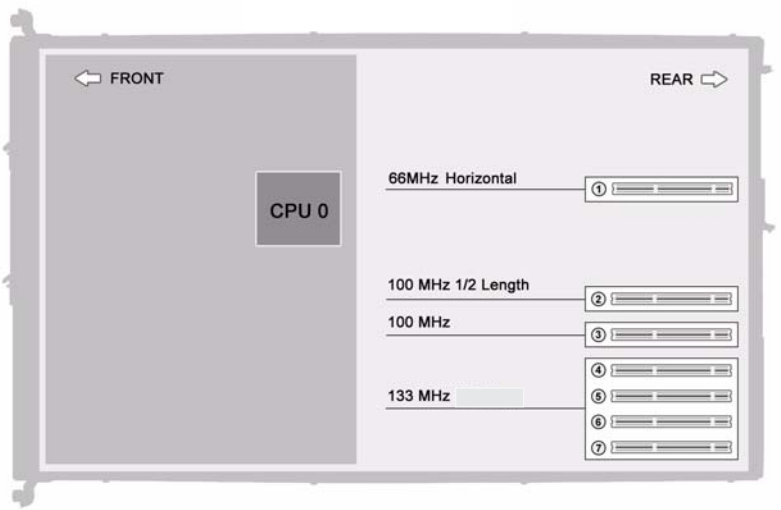

FIGURE 4-5 Locations of the PCI Card Slots in the Sun Fire V40z Server

4.5.1.4 Installing a Vertical PCI Card in a Vertical Slot

Follow these steps to install a vertical mount PCI card in one of the server's six vertical slots (see FIGURE 4-5 for location). Four of the six vertical slots have a mechanical retention latch (MRL); two of the slots have a retaining bracket.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the card you are replacing using one of the following two methods, depending on which slot you are installing to:**
   - If you are replacing a card in a slot that has a mechanical retention latch (MRL), push the button on the end of the MRL and lift the MRL flap (see FIGURE 4-6).
   - If you are replacing a card in a slot that does not have an MRL, remove the securing screw and the retaining bracket from the slot (see FIGURE 4-7).

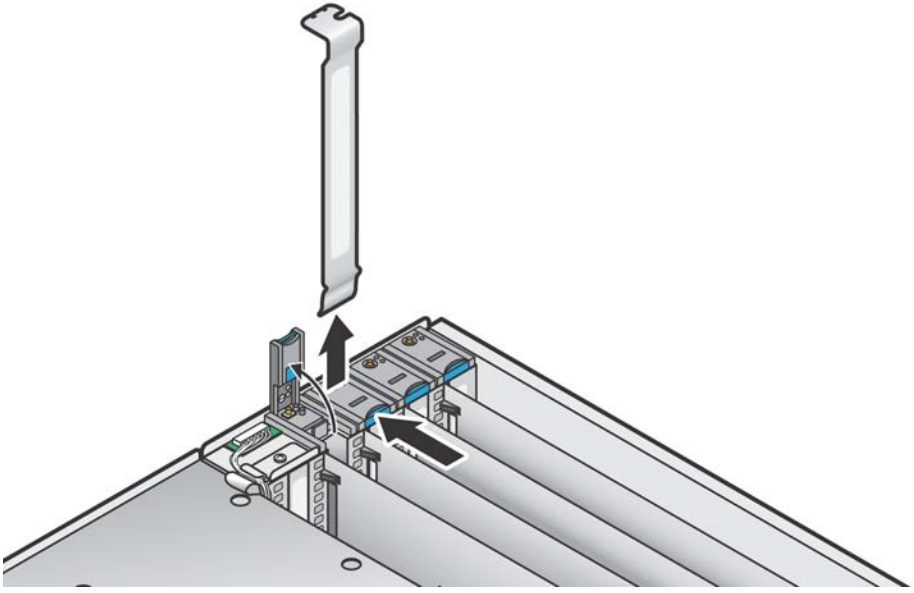

FIGURE 4-6 Removing or Installing a PCI Card in a Vertical Slot without an MRL

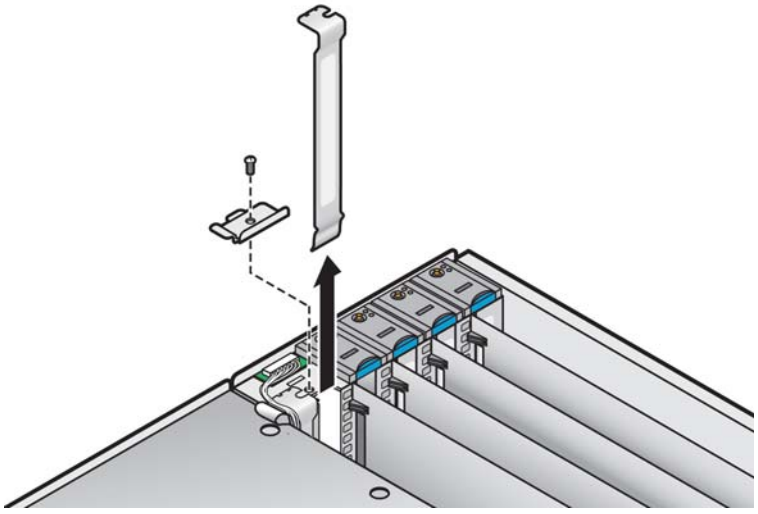

FIGURE 4-7 Removing or Installing a Vertical PCI Card That Does Not Have an MRL

Caution – Before you power on a *Sun Fire V40z* server the *first time*, you must open the top cover and remove the packaging insert from the server's PCI slots to ensure proper air flow and cooling. You can discard this packaging insert, which serves as protection during shipping.

Do NOT remove the plastic air-baffle inserts from the PCI slots.

3. **Remove the card you are replacing. If the slot is blank, remove its metal slot cover from the back panel and remove any plastic air-baffle insert from the PCI slot.**

Note – On the updated release (chassis PN 380-1206) of the server, a plastic air-baffle cage has been added and replaces the individual air-baffle inserts. When adding or removing a PCI card, you do not need to remove the air-baffle cage.

4. **Insert the new card into the slot. Push down evenly on both corners of the card to ensure it is seated correctly.**

5. **Secure the PCI card using one of the following two methods:**
   - If the slot has an MRL, close the MRL and push down on it until it clicks.
   - If the slot does not have an MRL, replace the retaining bracket and its single securing screw to the top of the card.
6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.1.5 Installing a Horizontal PCI Card and Riser

Follow these steps to install a horizontal-mount PCI card (see FIGURE 4-5 for the location). The server has one horizontal slot located under the power-supply cage assembly that supports one half-length, 66-MHz PCI card.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.
2. **Remove the power-supply cage assembly: see "Replacing a Power-Supply Cage Assembly" on page 4-39.**
3. **On the outside of the server back panel, loosen the screw holding the card latch (see** FIGURE 4-8**).**
4. **Raise the card latch as far as possible and then pivot it towards the rear of the chassis.**

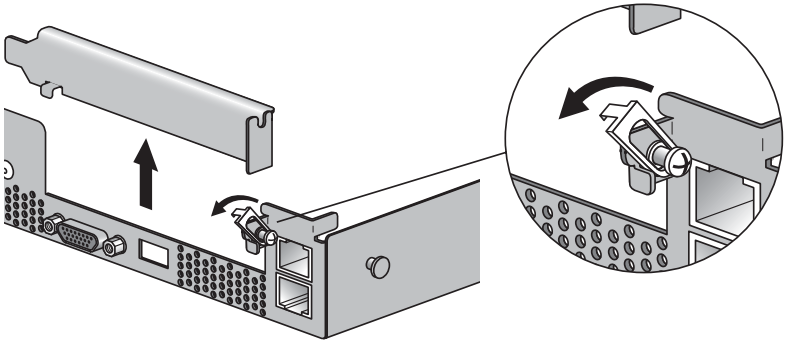

FIGURE 4-8 Removing or Installing a Horizontal PCI Card

5. **Remove any existing PCI card from the PCI riser. If the slot is blank, remove its metal slot cover from the server back panel.**

6. **Remove the PCI riser from the PCI card connector on the motherboard. Press on the connector-release levers to release the riser.**

7. **Install the new PCI card in the riser assembly (see** FIGURE 4-9**).**

8. **Re-install the riser with card into the connector on the motherboard. Push down evenly on both corners of the riser until the release levers close.**

9. **Pivot the back-panel card latch up and then slide it down until it captures the PCI card bracket. Tighten the screw to secure the latch.**

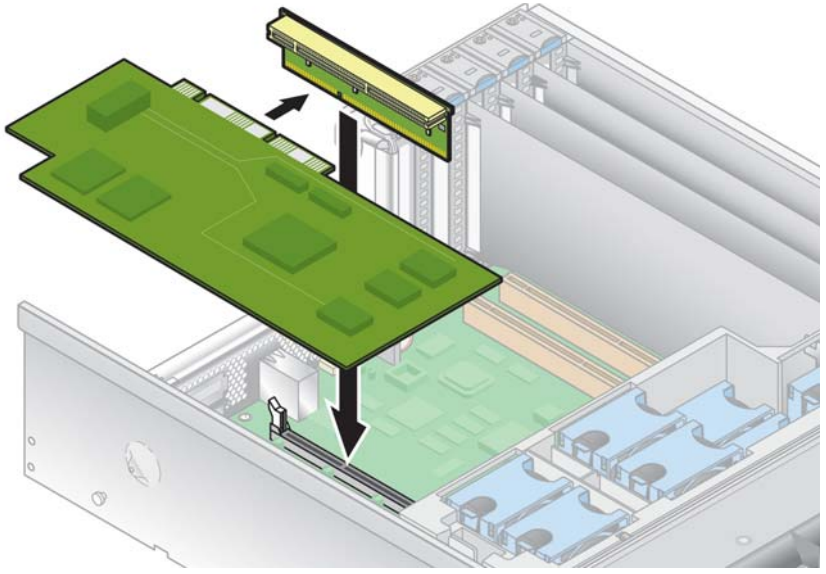

FIGURE 4-9 Installing the Horizontal PCI Card and Riser

10. **If you are installing an LSI MegaRAID card:**

    For an original release of the server, go to "To Install an LSI MegaRAID Card with Battery Backup in Original Release of the Sun Fire V40z Server" on page 4-19.

    For an updated release of the server, go to "To Install an LSI MegaRAID Card with Battery Backup in an Updated Release of the Sun Fire V40z Server" on page 4-20.

    Otherwise, skip to Step 11.

11. **Re-install the power-supply cage assembly: see "Replacing a Power-Supply Cage Assembly" on page 4-39.**

12. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

To Install an LSI MegaRAID Card with Battery Backup in Original Release of the Sun Fire V40z Server

---

Note – You must install this card in the horizontal PCI slot located under the power-supply cage.

When installing the LSI MegaRAID card with battery backup in the original release (chassis PN 380-1010) of the Sun Fire V40z server, you must plug the extender cable (included with the card) into the system's SCSI signal cable.

1. **If you have not already done so, remove the power-supply cage assembly, as described in "Installing a Horizontal PCI Card and Riser" on page 4-17.**

2. **Disconnect the server's SCSI signal cable from the motherboard.**

   FIGURE 4-10 shows the location of the SCSI-signal-cable motherboard connector on the original release (chassis PN 380-1010) of the Sun Fire V40z server.

   In this view, the rear fan-cage assembly and the power-supply cage have been removed. The SCSI connector is located under the power-supply cage; the SCSI signal cable is routed underneath the motherboard.

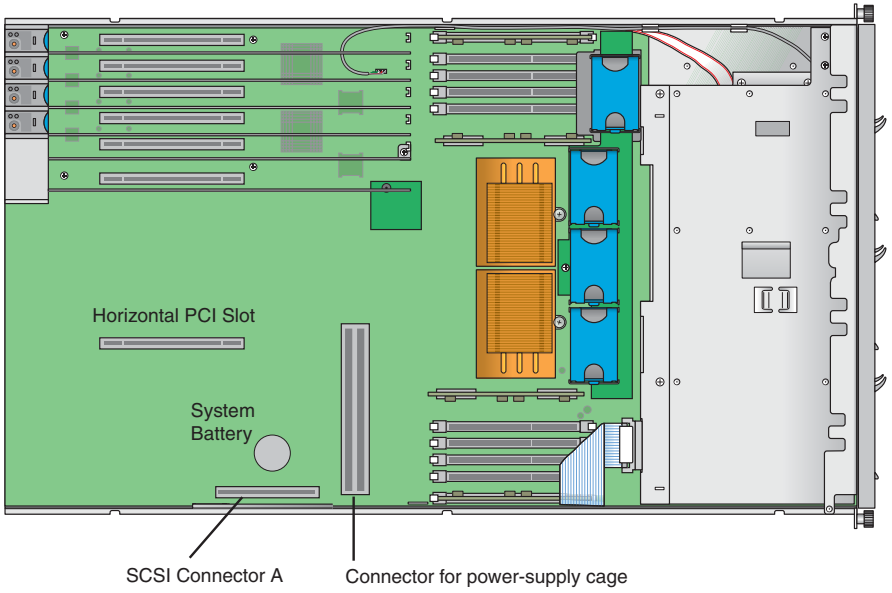

FIGURE 4-10 SCSI Signal Cable and Connector (Original Release of Sun Fire V40z Server)

3. **Plug the end of the extender cable that is labeled "SCSI Cable" into the SCSI signal cable that you disconnected from the motherboard.**

4. **Plug the other end of the extender cable, which is labeled, "SCSI CNTRLR Board," into the LSI MegaRAID card connector.**

   Lay the extender cable over any existing cards.

5. **Re-install the power-supply cage assembly as described at the end of the procedure "Installing a Horizontal PCI Card and Riser" on page 4-17.**

To Install an LSI MegaRAID Card with Battery Backup in an Updated Release of the Sun Fire V40z Server

---

Note – You must install this card in the horizontal PCI slot located under the power-supply cage.

When installing the LSI MegaRAID card with battery backup in the updated release (chassis PN 380-1206) of the Sun Fire V40z server, you replace the SCSI signal cable in the system with the new SCSI signal cable that is included with the card.

1. **If you have not already done so, remove the power-supply cage assembly, as described in "Installing a Horizontal PCI Card and Riser" on page 4-17.**

2. **Disconnect the server's SCSI signal cable from the motherboard and from the SCSI backplane.**

   FIGURE 4-11 shows the location of the SCSI-signal-cable motherboard connector on the updated release (chassis PN 380-1206) of the server; in this view, the rear fan-cage assembly and the power-supply cage have been removed. SCSI connector A is located just in front of the connector for the power-supply cage, under the rear fan-cage assembly. The SCSI signal cable is routed along the sidewall of the chassis and does not pass underneath the motherboard.

3. **Plug one end of the new SCSI signal cable into the LSI MegaRAID card.**

4. **Plug the other end of the new SCSI signal cable into the SCSI backplane.**

5. **Lay the extender cable over any existing cards.**

6. **Re-install the power-supply cage assembly as described at the end of the procedure "Installing a Horizontal PCI Card and Riser" on page 4-17.**

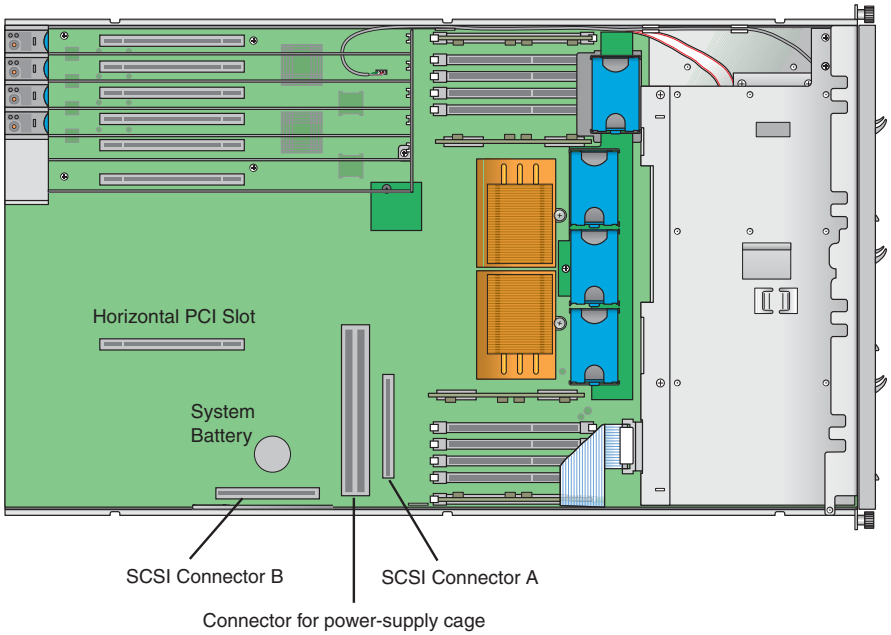

FIGURE 4-11 SCSI Signal Cable and Connector (Updated Release of Sun Fire V40z Server)

4.5.2 SCSI Hard Disk Drive and Carrier

The following procedure describes how to remove and replace a SCSI hard disk drive (HDD) and carrier.

Note – SCSI HDDs are hot-pluggable in integrated-mirroring (IM) configurations. See "Integrated Mirroring" on page D-2 for more information.

See also "SCSI ID Assignments" on page 4-5.

4.5.2.1 Removing an HDD and Carrier

1. **Power off the system as described in "Powering Off the Server and Removing the Cover" on page 4-2.**

   It is not necessary to remove the cover for this procedure.

2. **Squeeze the release latch and carefully swing the arm to the left as far as it will go (see** FIGURE 4-12**).**

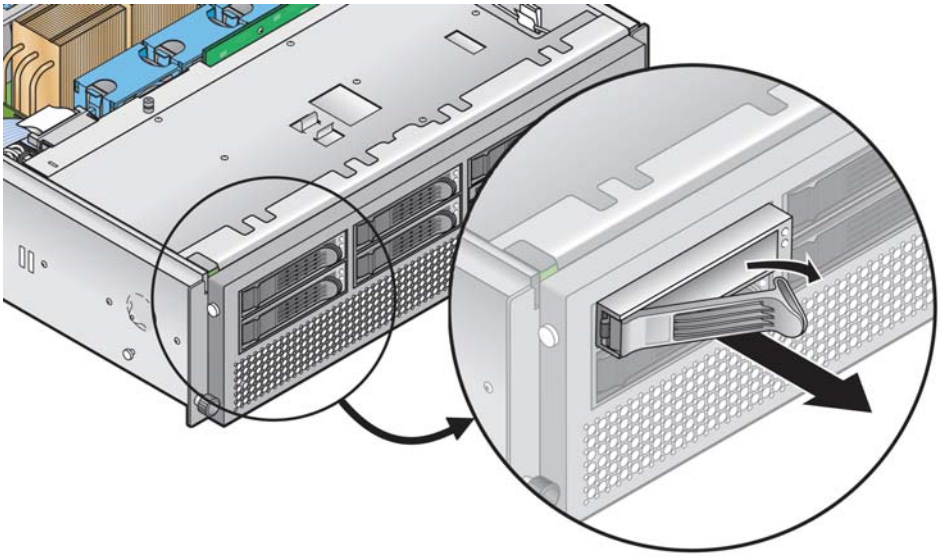

FIGURE 4-12 SCSI Hard Disk Drive Carrier and Release Latch

3. **Grasp the carrier bezel with both hands and carefully pull the carrier out of the drive bay.**

Note – Avoid using the arm to remove the carrier.

4.5.2.2 Installing an HDD and Carrier

1. **Squeeze the HDD release latch and carefully swing the arm to the left as far as it will go.**
2. **Grasping the body of the drive in both hands, carefully guide the connector end of the HDD into the drive bay, sliding the carrier into the bay until the arm engages and partially closes itself.**
3. **Push the arm forward and latch it to lock the carrier in place.**

4.5.2.3 Installing an Optional Sixth HDD and Adapter

You can optionally install a sixth HDD in the bay that normally contains the DVD/diskette drive assembly. To do this, install the required adapter in the bay as described in the following procedure.

1. **Remove any DVD/diskette drive assembly from its bay.**

   See "DVD-ROM/Diskette Drive Assembly" on page 4-24 for instructions.

2. **Install the adapter into the chassis below the operator-panel assembly, as shown in** FIGURE 4-13**. Push the adapter in until it stops against the chassis.**

3. **Tighten the two captive screws as shown to secure the adapter in place.**

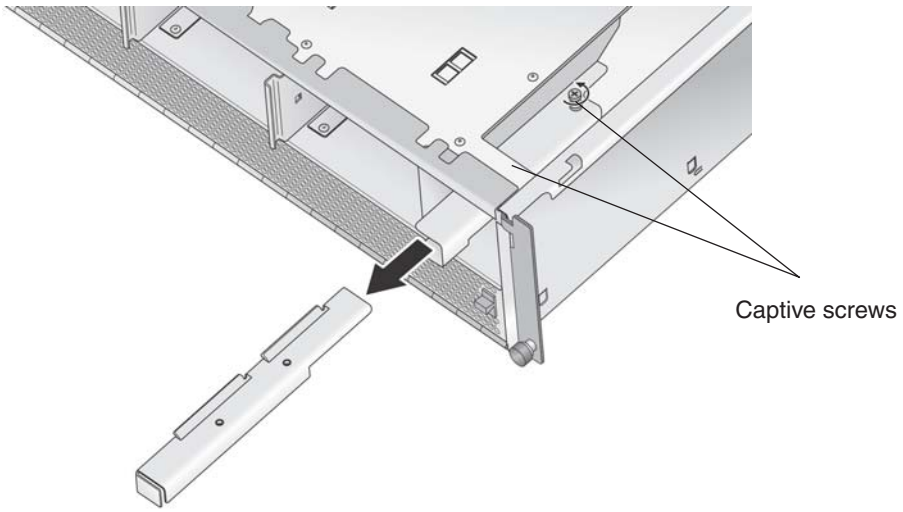

FIGURE 4-13 Installing the Sixth HDD Bay Adapter

4. **Install the HDD and carrier as described in "Installing an HDD and Carrier" on page 4-22.**

5. **Disable the diskette-drive setting in the server BIOS:**

   a. **Reboot the server and press F2 to enter BIOS setup when the server reboots.**

   b. **In the BIOS Main menu, select Legacy Diskette A and change its setting to Disabled.**

   c. **Press F10 to exit BIOS settings.**

      When you are prompted whether to save changes, select Yes.

4.5.3 DVD-ROM/Diskette Drive Assembly

The following procedure describes how to replace the DVD-ROM/Diskette Drive assembly.

Note – Removable drives are fragile components that must be handled with care. To prevent damage to the system, damage to a removable drive, or loss of information, observe these precautions: Before removing a diskette drive or DVD-ROM drive, be sure that a diskette or disc is not in the drive. Be sure that the DVD-ROM tray is closed. While handling a drive, avoid touching the connector.

---

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the cable service loop from the clip on the right wall of the server chassis, including the round, black USB cable.**

3. **On the front panel of the server, press in the latch on the left side of the DVD-ROM/Diskette Drive assembly and remove it from the server (see** FIGURE 4-14**).**

   Feed the cable through the openings in the chassis as you remove the assembly.

4. **Disconnect the ribbon cable connector from the rear of the assembly.**

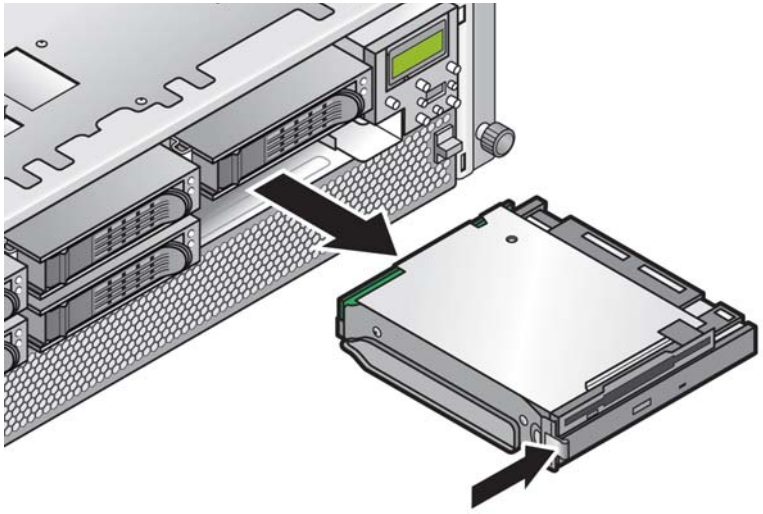

FIGURE 4-14 Removing the DVD-ROM/Diskette Drive Assembly

5. **To install the new assembly, connect the ribbon cable connector to the rear of the assembly.**

6. **Align the assembly with the bay opening and press in firmly on both corners of the assembly until the latch clicks into place.**

   As you insert the assembly, pull the excess cable back in through the openings in the chassis.

7. **Replace the cable service loop in the clip on the right wall of the server chassis.**

Note – To avoid possible electrical emission interference, do not leave the ribbon cable folded up under the assembly. Instead, retract the slack cable and secure it with the clip on the side of the chassis.

---

8. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.4 CPU Card

This card is an optional daughter-board that slides into the front of the server.

Note – This procedure can be done with the server mounted in a rack. If it is in a rack, pull the server forward from the rack about 3 inches (76 mm) to provide clearance before opening the CPU card door.

---

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to “Powering Off the Server and Removing the Cover” on page 4-2.

   It is not necessary to remove the cover for this procedure.

2. **Remove the front bezel from the server by pressing in on the rubberized buttons on each side of the bezel, then swinging the bezel top downward (see** FIGURE 4-15**).**

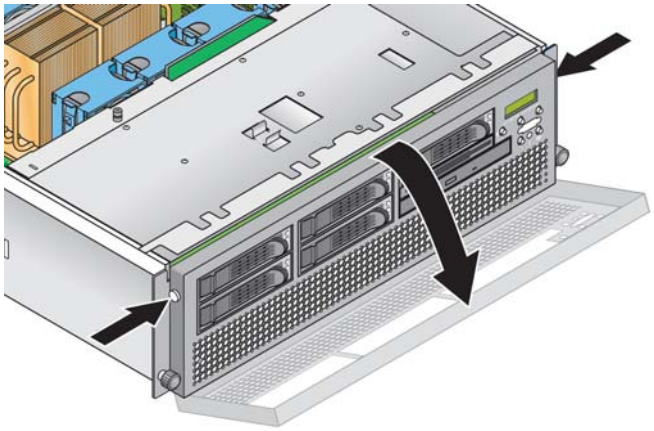

FIGURE 4-15 Removing the Front Bezel

3. **Open the CPU card door, which is located under the hard drive bays, to access the CPU card. Press down on the two buttons on the door and swing it downward so that it is open 180 degrees from the closed position (see** FIGURE 4-16**).**

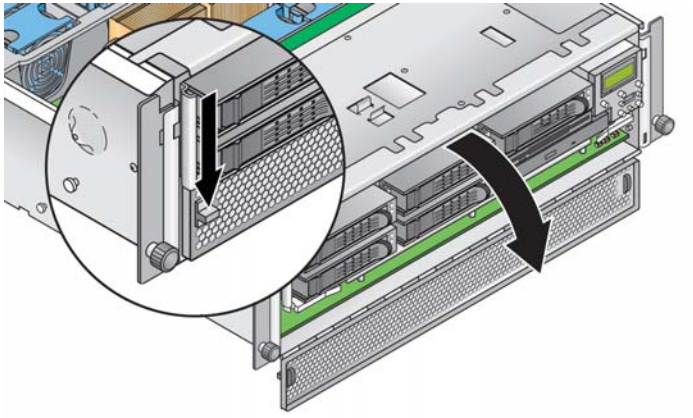

FIGURE 4-16 Opening the CPU Card Door

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

4. **If you are installing the CPU card as a new option, skip to Step 8.**

   If you are replacing an existing card, continue with the next step.

5. **Open the two plastic levers on the CPU card corners *simultaneously* to release it from its backplane, then carefully pull it out of the server (see** FIGURE 4-17**).**

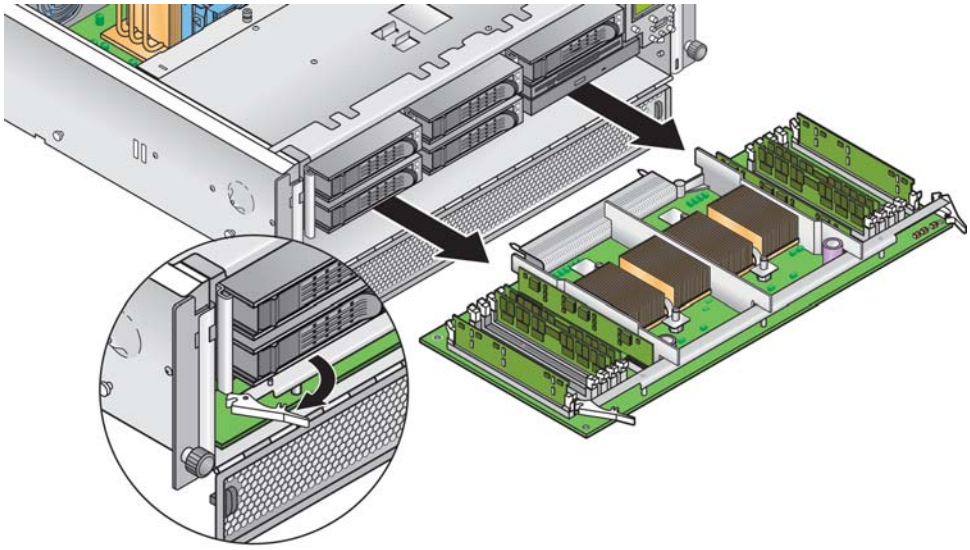

FIGURE 4-17 Removing the CPU Card From the Chassis

6. **Set the CPU card on an ESD-resistant surface.**

7. **Remove any replaceable components (CPUs, memory modules, VRMs) from the old CPU card and set them aside on an ESD-resistant surface.**

   Refer to the following procedures:

   - "Replacing a Memory VRM on the CPU Card" on page 4-42
   - "Replacing a CPU VRM on the CPU Card" on page 4-47
   - "Replacing a Memory Module on the CPU Card" on page 4-52
   - "Replacing a CPU on the Optional CPU Card" on page 4-58

8. **Install components to the new CPU card (either as new components or as components you are transferring from an old CPU card).**

   Refer to the following procedures:

   - "Replacing a Memory VRM on the CPU Card" on page 4-42
   - "Replacing a CPU VRM on the CPU Card" on page 4-47
   - "Replacing a Memory Module on the CPU Card" on page 4-52
   - "Replacing a CPU on the Optional CPU Card" on page 4-58

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

9. **After you install all components to the new CPU card, install it into the server:**

   a. **Carefully align the rear corners of the CPU card with the plastic alignment guides inside the server chassis, then slide the CPU card into the chassis.**

   b. **Press in firmly and evenly on both corners of the CPU card until it engages the backplane.**

   c. **Lock down the two plastic levers on the corners of the CPU card *simultaneously* to secure it in place.**

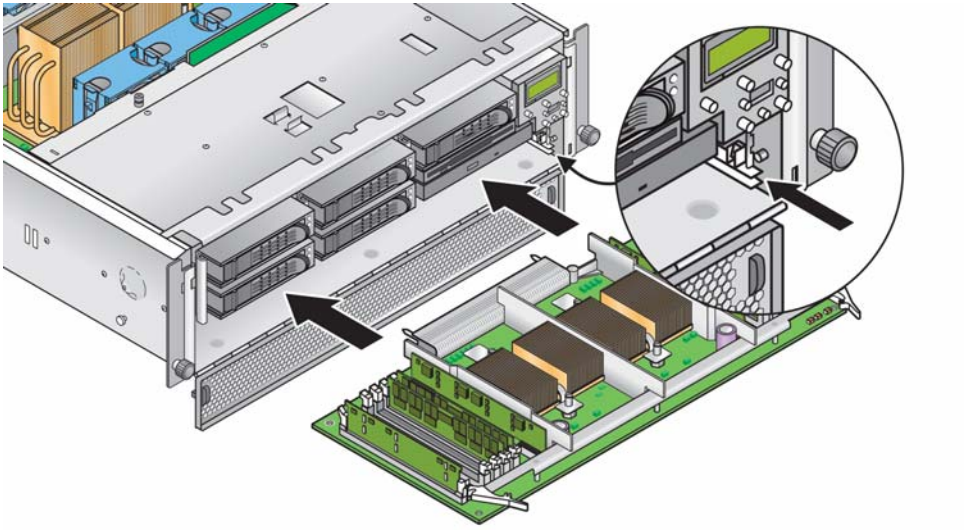

FIGURE 4-18 Installing the CPU Card Into the Chassis

10. **Close the CPU card door.**

11. **Replace the front bezel onto the server.**

4.5.5 Operator Panel and LCD Assembly

The following procedure describes how to replace the operator panel and liquid crystal display (LCD) assembly.

1. **Power off the system and remove the cover as described in "Powering Off the Server and Removing the Cover" on page 4-2.**
2. **Remove the two non-captive screws and loosen the single captive screw that secures the assembly to the chassis (see** FIGURE 4-19**).**

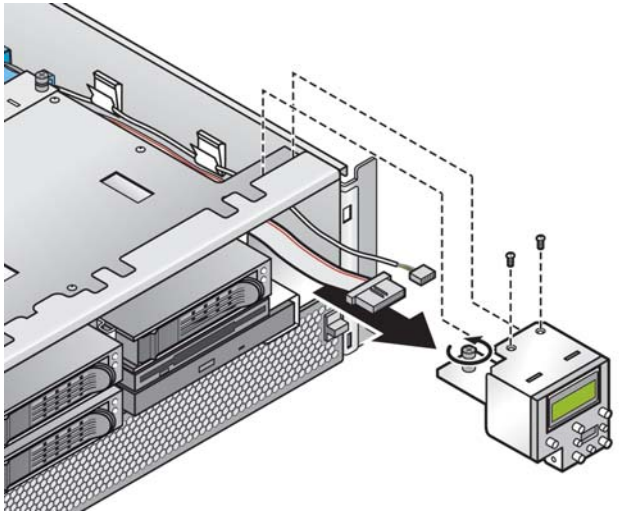

FIGURE 4-19 Removing the Operator Panel/LCD Assembly

3. **Pull the assembly out from the chassis front about one inch, until you can reach the two cables attached to the rear of the assembly.**
4. **Disconnect the two cables from the circuit board connectors on the rear of the assembly.**
5. **Remove the assembly from the chassis.**
6. **To install the new assembly, reverse Step 2 through Step 5.**
7. **Check the routing of all cables for obstructions and then reinstall the cover.**

4.5.6 SCSI Backplane Assembly

The following procedure describes how to replace the SCSI backplane assembly.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove all HDD carriers and the DVD-ROM/Diskette Drive assembly from the bays on the server front.**

   All drives and carriers must be disconnected from the SCSI backplane before you can remove it.

3. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

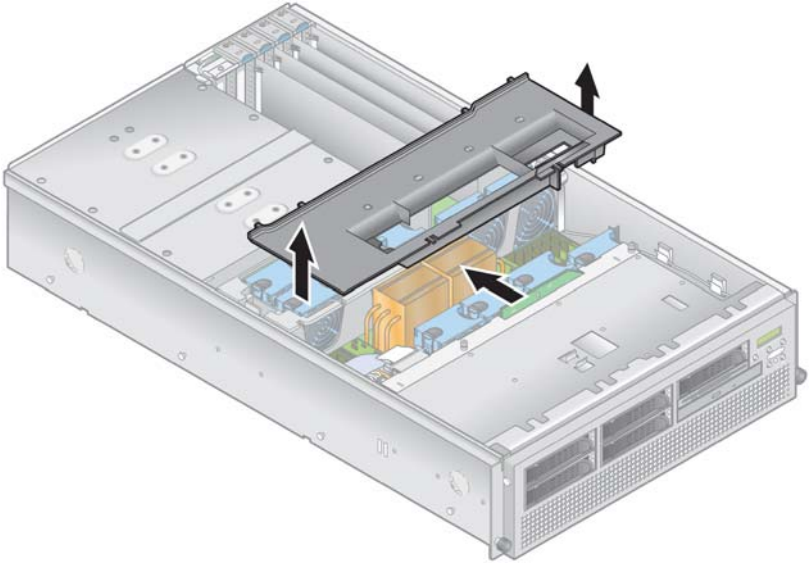

FIGURE 4-20 Removing the Main Air Baffle

4. **Disconnect the SCSI signal cable and the power cable that connect to the rear side of the SCSI backplane circuit board (see** FIGURE 4-21**):**

5. **Loosen the two captive screws that secure the SCSI backplane assembly to the chassis (see** FIGURE 4-21**).**

6. **Lift the SCSI backplane assembly up and out of the chassis.**

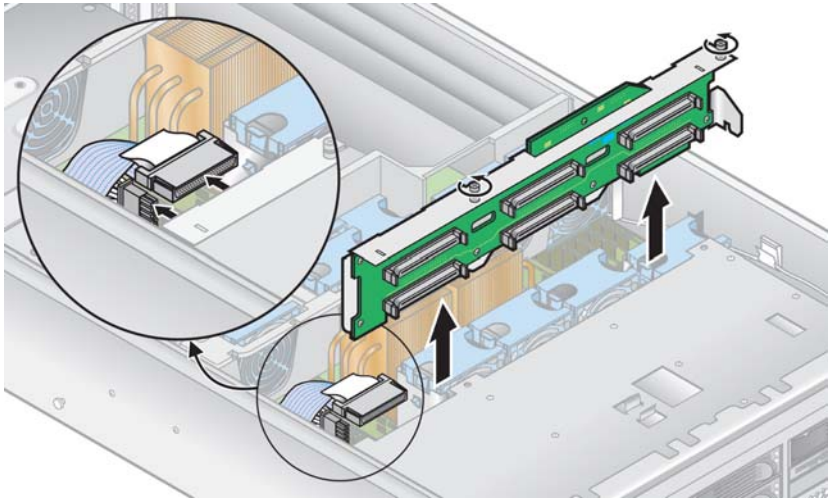

FIGURE 4-21 Removing the SCSI Backplane Assembly

7. **Install the new SCSI backplane assembly by reversing Step 6 through Step 2.**
8. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.7 Cooling Fans

The twelve replaceable cooling fans in the Sun Fire V40z server plug into two different fan-cage assemblies. Use the correct procedure in this section:

- To replace an individual cooling fan, see "Replacing an Individual Cooling Fan" on page 4-32.
- The front fan-cage assembly holds fans 9 through 12. See "Replacing the Front Fan-Cage Assembly" on page 4-34.
- The rear fan-cage assembly holds fans 1 through 8. See "Replacing the Rear Fan-Cage Assembly" on page 4-35.

4.5.7.1 Fan Numbering

The cooling fans in a Sun Fire V40z server are numbered as shown in FIGURE 4-22.

- For the rear fans, the fan numbers are imprinted on the plastic of the rear fan-cage assembly.
- For the front fans, the fan numbers are imprinted on the main air baffle that normally sits on top of the front fan-cage assembly.

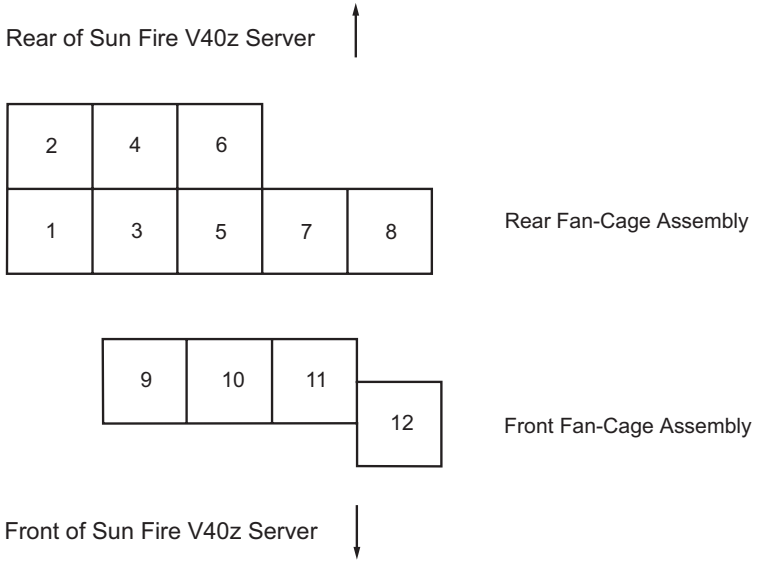

FIGURE 4-22 Fan Numbering in a Sun Fire V40z Server (top view)

4.5.7.2 Replacing an Individual Cooling Fan

Caution – If you replace a fan while the server is still running, you must install the new fan quickly. Leaving the fan cage empty disrupts proper airflow and may cause damage to the system. Also, keep the main air baffle cover in place to ensure proper air flow so that fans or other components do not malfunction or become damaged.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Identify the fan(s) to be replaced in either the front or rear fan cage.**

4. **Squeeze the retainer clip on the edge of the fan, then pull the fan straight up to disengage its connector and remove it from its fan cage (see** FIGURE 4-23**).**

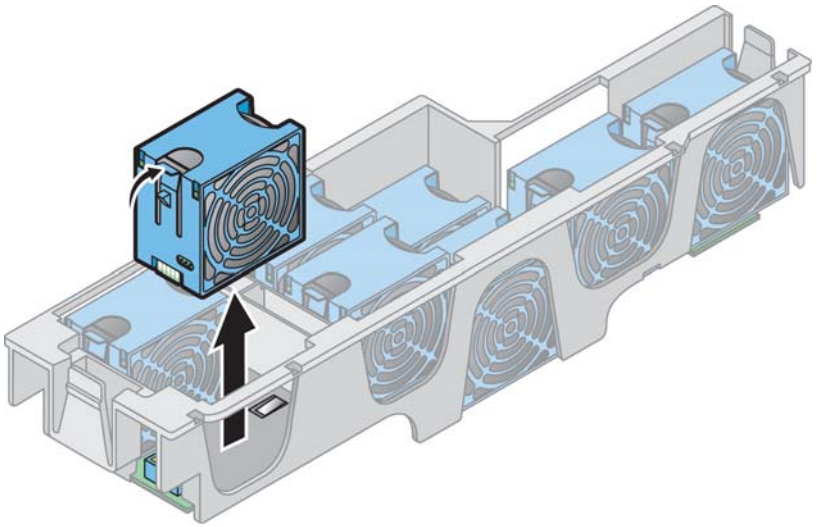

FIGURE 4-23 Removing an Individual Cooling Fan (Cage Shown Removed From Server)

5. **To install a new fan, align it with the bay in the fan cage and push down firmly and evenly on both top corners of the fan to engage it with the cage connector.**

Caution – Ensure that the fan airflow direction is correct (front to rear) by installing the fan so that the airflow direction arrow points towards the rear of the chassis. After installing a new fan, allow sufficient time for the system to recognize the fan and to determine whether it is functioning properly.

6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.7.3 Replacing the Front Fan-Cage Assembly

Caution – On the updated release of the Sun Fire V40z server (chassis PN 380-1206), if you remove the front or rear fan-cage assembly from the motherboard while the server is powered on and running, the server will automatically perform a hard power-off.

We recommend that you power off the server before servicing any components.

The front fan-cage assembly holds fans 9 through 12 (numbering is indicated on the top of the main air baffle).

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Remove the plastic air baffle from the base of fan 12 (see** FIGURE 4-24**).**

4. **Remove the three screws that secure the fan-cage assembly to the motherboard (see** FIGURE 4-24**).**

5. **Lift the assembly up and out of the server.**

6. **Remove all individual fans from the fan cage.**

   Squeeze the retainer clip on the edge of the fan, then pull the fan straight up to disengage its connector and remove it from the fan cage (see FIGURE 4-23).

7. **To install the new fan-cage assembly, reverse Step 6 through Step 2.**

8. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

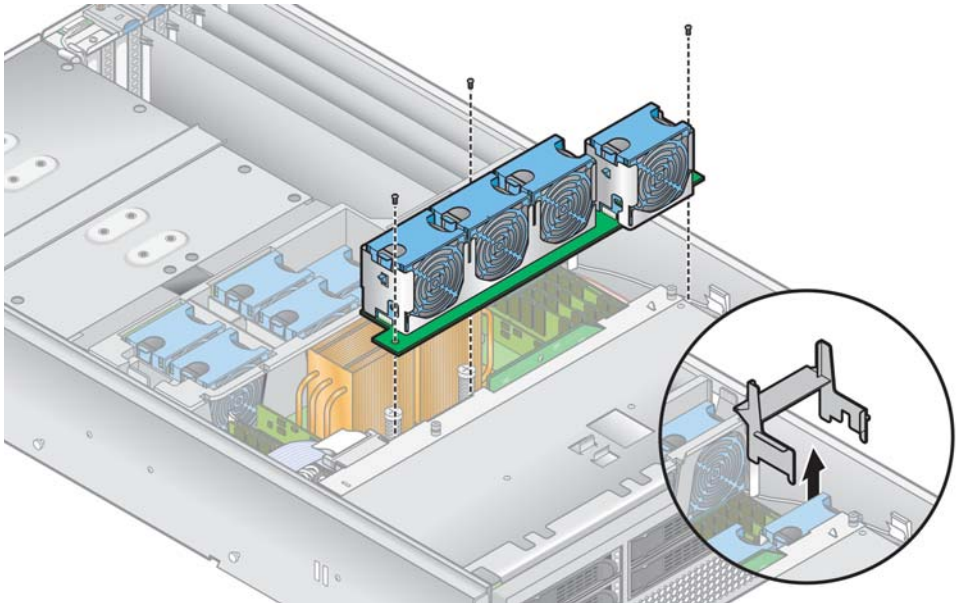

FIGURE 4-24 Removing the Front Fan-Cage Assembly

4.5.7.4 Replacing the Rear Fan-Cage Assembly

Note – On the updated release of the Sun Fire V40z server (chassis PN 380-1206), if you remove the front or rear fan-cage assembly from the motherboard while the server is powered on and running, the server will automatically perform a hard power-off.

We recommend that you power off the server before servicing any components.

The rear fan-cage assembly holds fans 1 through 8 (numbering is indicated on the top of the rear fan cage).

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Squeeze the retainer clips on each end of the fan cage inward (see** FIGURE 4-25**)**
4. **Pull straight up on the fan-cage assembly to disengage it from the motherboard connector.**

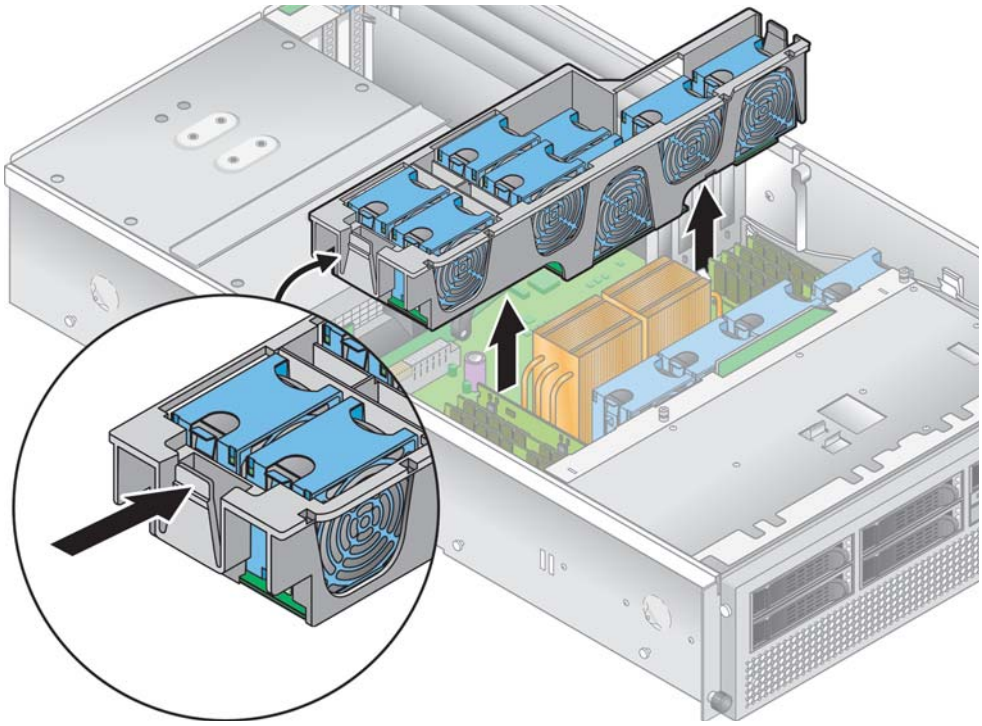

FIGURE 4-25 Removing the Rear Fan-Cage Assembly

5. **Lift the assembly up and out of the server.**
6. **Remove all individual fans from the fan cage.**

   Squeeze the retainer clip on the edge of a fan, then pull the fan straight up to disengage its connector and remove it from the fan cage (see FIGURE 4-23).
7. **To install the new fan-cage assembly, first install all individual fans into the new fan cage (see "Replacing an Individual Cooling Fan" on page 32).**

Caution – When you replace the rear fan-cage assembly, make sure that the fan-cage connector engages fully with the motherboard connector. It is possible to power on the server with the fan cage not connected to the motherboard. When you power on the server, ensure that all fans are spinning and that the fan LEDs are on.

8. **Align the fan cage with the chassis and push down on both ends of the fan cage until both retaining clips click securely into place and the fan-cage connector fully engages with the motherboard connector.**
9. **Power on the server before you replace the cover so that you can verify that all fans are spinning and that the fan LEDs are on.**

   If the fans are not spinning, it is very important that you power off the server and reseat the fan cage so that the motherboard connector is fully engaged.
10. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.8 Power Supplies and Power-Supply Cage Assembly

The Sun Fire V40z server can hold one or two power supplies in its power-supply cage. Use the correct procedure in this section:

- "Replacing an Individual Power Supply" on page 4-37
- "Replacing a Power-Supply Cage Assembly" on page 4-39

4.5.8.1 Replacing an Individual Power Supply

Note – The individual power supplies on the Sun Fire V40z server are hot-swappable. You do not need to power off the server before removing and replacing a power supply.

1. **At the outside rear of the server, pull the finger-ring on the power-supply handle toward you to disengage the power-supply connector from the power distribution backplane (see** FIGURE 4-26**).**

Note – A twisted, plastic tie-wrap through the finger ring holds the power-supply handle in place. Untwist this tie-wrap to pull the handle out.

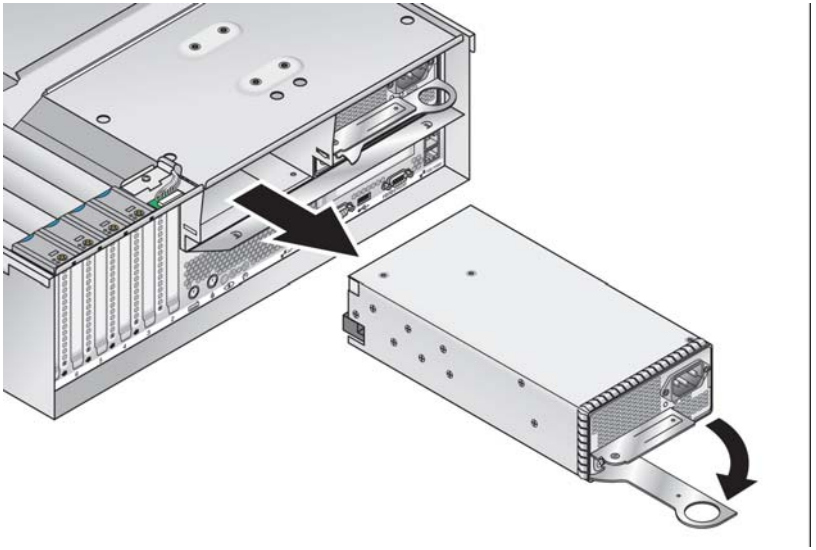

FIGURE 4-26 Removing an Individual Power Supply

2. **Slide the power supply out of the power-supply cage and chassis.**

Caution – You must open the power supply's handle before you insert it into the power-supply cage. If the handle is left closed, it will deform the metal to which it latches.

Also, failure to open the power-supply handle only partially engages the power supply's connector, which can cause the power-reset sequence (PRS) code to enter a failed state. If this happens, the system-fault LED on the front panel will blink twice per second.

To recover a system in this bad PRS state:
1) Disconnect all AC power and reseat all power supplies.
2) Wait five minutes.
3) Reconnect AC power cords to all power supplies.

---

3. **To install the new power supply:**

   a. **Open the power-supply handle to the fully open position, as shown in** FIGURE 4-26**.**

   b. **Insert the power supply into the power-supply cage and push it inward until it stops at the backplane.**

   c. **Push the power-supply handle closed until it locks into place.**

4.5.8.2 Replacing a Power-Supply Cage Assembly

The Sun Fire V40z server contains a power-supply cage assembly that can hold up to two power supplies. The assembly includes a power distribution backplane and an air baffle.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove all power supplies from the power-supply cage.**

   See "Replacing an Individual Power Supply" on page 4-37.

3. **Remove the power-supply cage assembly:**

   a. **Pull the metal handle on the top of the cage toward the front of the server so that the hinged cams lift the cage and disconnect it from the motherboard (see** FIGURE 4-27**).**

   b. **Lift the front of the cage and disengage its metal tabs from their mounting holes on the server back panel to remove it from the chassis.**

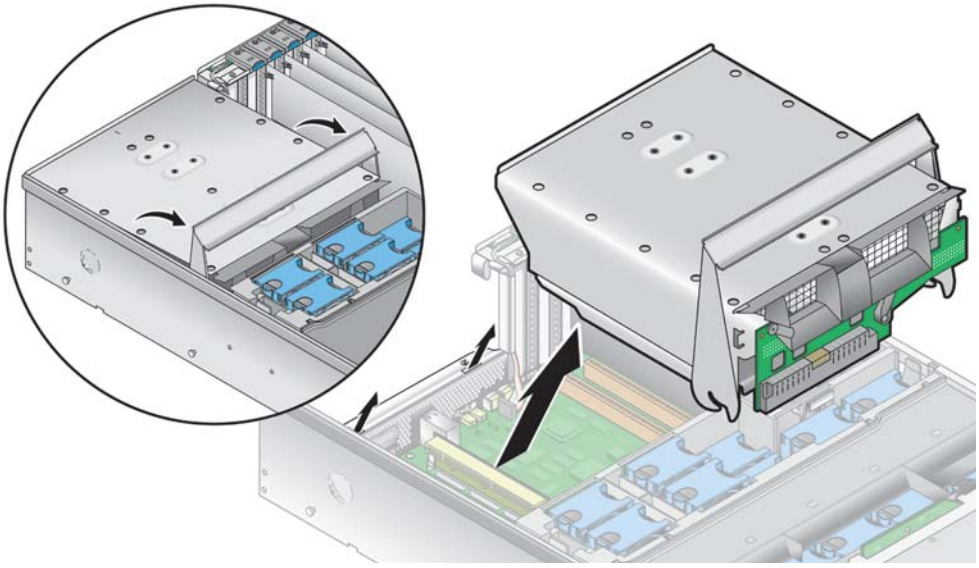

FIGURE 4-27 Removing the Power-Supply Cage Assembly

4. **To install the new power-supply cage assembly:**

   a. **Insert the assembly into the chassis with the rear of the assembly angled downward and the assembly handle in the fully open position.**

   b. **Carefully insert the metal tabs on the rear of the assembly into their slots on the chassis back panel.**

   c. **With the tabs in place, set the front of the assembly down on the motherboard connector.**

   d. **Press the metal handle on the top of the assembly down until the connectors on the motherboard engage with the assembly backplane.**

5. **Re-install the power supplies into the new power-supply cage assembly.**

   See "Replacing an Individual Power Supply" on page 4-37.

6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.9 Memory Voltage-Regulator Modules

Caution – The Registered DDR 400 memory DIMMS can only be used in the updated release (chassis PN 380-1206) of the Sun Fire V40z server.

If you are installing the new Registered DDR 400 memory DIMMs in your server, you must also install the new 2.6V voltage-regulator module (VRM) (PN 370-7747).

The Sun Fire V40z server contains memory voltage-regulator modules (VRMs) in four locations. Two memory VRMs are on the motherboard and two are on the optional CPU card. Use the correct procedure in this section:

- "Replacing a Memory VRM on the Motherboard" on page 4-41
- "Replacing a Memory VRM on the CPU Card" on page 4-42

4.5.9.1 Replacing a Memory VRM on the Motherboard

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Remove the rear fan-cage assembly. Squeeze the retainer clips on each end of the fan cage inward (see** FIGURE 4-25**).**

4. **Pull straight up on the fan-cage assembly to disengage it from the motherboard connector.**

5. **Lift the assembly up and out of the server.**

6. **Identify the memory VRM that must be replaced.**

   The memory VRM is in the outer slot, furthest from the CPU.

7. **Remove a memory VRM by pressing down on the ejector bars at both ends of the socket (see** FIGURE 4-28**).**

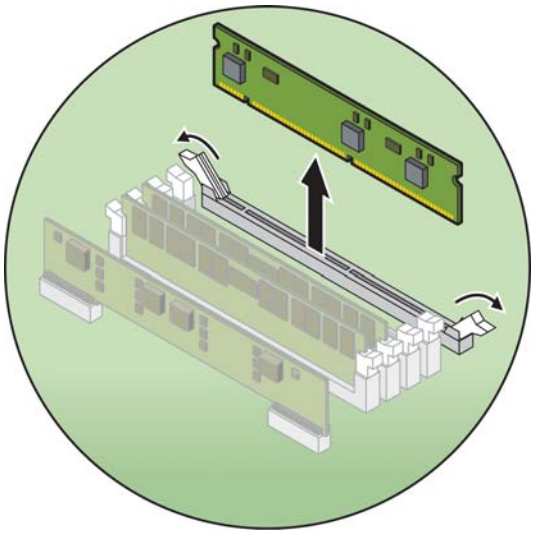

FIGURE 4-28 Removing a Memory VRM

8. **Install the new VRM to the socket by pressing down firmly and evenly on both top corners, until the ejector levers close over the notches on the VRM.**
9. **Re-install the rear fan-cage assembly.**
10. **Replace the main air baffle.**
11. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.9.2 Replacing a Memory VRM on the CPU Card

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

   It is not necessary to remove the cover for this procedure.

2. **Remove the front bezel from the server by pressing in on the rubberized buttons on each side of the bezel, then swinging the bezel top downward (see** FIGURE 4-15**).**
3. **Open the CPU card door, which is located under the hard drive bays, to access the CPU card. Press in the two buttons on the door and swing it downward so that it is open 180 degrees from the closed position (see** FIGURE 4-16**).**

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

4. **Open the two plastic levers on the CPU card corners *simultaneously* to release it from its backplane, then carefully pull it out of the server (see** FIGURE 4-17**).**
5. **Set the CPU card on an ESD-resistant surface.**
6. **Identify the memory VRM that must be replaced.**

   The memory VRM is in the outer slot, furthest from the CPU.
7. **Remove a memory VRM by pressing down on the ejector bars at both ends of the socket (see** FIGURE 4-28**).**
8. **Install the new VRM to the socket by pressing down firmly and evenly on both top corners, until the ejector levers close over the notches on the VRM.**
9. **Replace the CPU card into the server (see** FIGURE 4-18**):**
   a. **Carefully align the rear corners of the CPU card with the plastic alignment tracks inside the server chassis, then slide the CPU card into the tracks.**
   b. **Press in firmly and evenly on both corners of the CPU card until it engages the backplane.**
   c. **Lock down the two plastic latches on the corners of the CPU card to secure it in place.**
10. **Close the CPU card door.**
11. **Replace the front bezel onto the server.**

4.5.10 CPU Voltage-Regulator Modules

The Sun Fire V40z server contains CPU voltage-regulator modules (VRMs) in four locations. Two CPU VRMs are on the motherboard and two are on the optional CPU card. Use the correct procedure in this section:

- "Replacing a CPU VRM on the Motherboard" on page 4-44
- "Replacing a CPU VRM on the CPU Card" on page 4-47

4.5.10.1 Before You Start

This procedure covers both the original release of the Sun Fire V40z server (chassis part number [PN] 380-1010) and the updated release of the server (chassis PN 380-1206).

- The updated release of the server implements wire clips to secure the CPU VRMs in place, on both the motherboard and the auxiliary CPU card (see FIGURE 4-29). The original release of the server does not have these clips.
- The CPU VRM for the updated release has more pins than the CPU VRM for the original release. These VRMs are **not** interchangeable.
- The CPU VRM for the original release of the Sun Fire V40z server can also be used in the original release (chassis PN 380-0979) and first updated release (chassis PN 380-1168) of the Sun Fire V20z server.
- The CPU VRM for the updated release of the Sun Fire V40z server can also be used in the second updated release of the Sun Fire V20z server (chassis PN 380-1194).

4.5.10.2 Replacing a CPU VRM on the Motherboard

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Remove the rear fan-cage assembly. Squeeze the retainer clips on each end of the fan cage inward (see** FIGURE 4-25**).**

4. **Pull straight up on the fan-cage assembly to disengage it from the motherboard connector.**

5. **Lift the assembly up and out of the server.**

6. **Identify the CPU VRM that must be replaced.**

   The CPU VRM is in the inner slot, closest to the CPU.

Note – For the VRM for CPU1 (from the front of the server, CPU1 is on the right side), first remove the plastic air baffle from fan 12.

---

7. ***(Updated release of Sun Fire V40z server only)*** **Remove the wire clip that secures the CPU VRM in place (see** FIGURE 4-29**.)**

   a. **With your index fingers, gently lift up on either side of the horizontal section of the wire clip and pull it back over the top of the VRM.**

FIGURE 4-29 Removing the Wire Clip

Caution – To avoid damaging the VRM, do not rock the VRM from side to side when removing or inserting it. Instead, pull straight up on both ends when removing the VRM and push straight down on both ends when inserting it.

---

8. **Remove the CPU VRM by pulling it straight up, out of its socket (see** FIGURE 4-30**).**

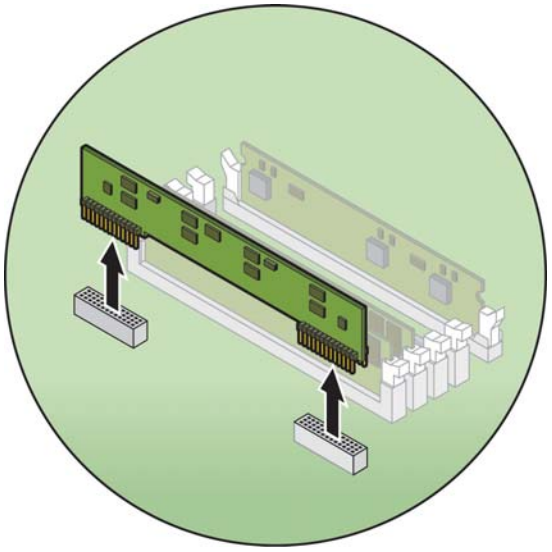

FIGURE 4-30 Removing a CPU VRM

Caution – When installing a VRM, ensure that pin "A1", on the VRM, is aligned with the "A1" reference designation on the motherboard.

9. **Press the new CPU VRM into the empty socket, ensuring that the notch in the CPU VRM aligns with the key in the connector.**
10. ***(Updated release of Sun Fire V40z server only)*** **Reposition the wire clip to secure the CPU VRM in place.**
    a. **With your index fingers, gently lift up on either side of the horizontal section of the wire clip, and reposition it over the top of the VRM.**
11. **If you removed the plastic air baffle from fan 12 (see Step 6), replace the air baffle now.**
12. **Re-install the rear fan-cage assembly.**
13. **Replace the main air baffle.**
14. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.10.3 Replacing a CPU VRM on the CPU Card

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

   It is not necessary to remove the cover for this procedure.

2. **Remove the front bezel from the server by pressing in on the rubberized buttons on each side of the bezel, then swinging the bezel top downward (see** FIGURE 4-15**).**

3. **Open the CPU card door, which is located under the hard drive bays, to access the CPU card. Press in the two buttons on the door and swing it downward so that it is open 180 degrees from the closed position (see** FIGURE 4-16**).**

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

4. **Open the two plastic levers on the CPU card corners *simultaneously* to release it from its backplane, then carefully pull it out of the server (see** FIGURE 4-17**).**

5. **Set the CPU card on an ESD-resistant surface.**

6. **Identify the CPU VRM that must be replaced.**

   The CPU VRM is in the inner slot, closest to the CPU.

7. ***(Updated release of Sun Fire V40z server only)* Remove the wire clip that secures the CPU VRM in place (see** FIGURE 4-29**).**

   a. **With your index fingers, gently lift up on either side of the horizontal section of the wire clip (arrow 1), and pull it back over the top of the VRM.**

Caution – To avoid damaging the VRM, do not rock the VRM from side to side when removing or inserting it. Instead, pull straight up on both ends when removing the VRM and push straight down on both ends when inserting it.

8. **Remove the CPU VRM by pulling it straight up, out of its socket (see** FIGURE 4-30**).**

Caution – When installing a VRM, ensure that pin "A1", on the VRM, is aligned with the "A1" reference designation on the motherboard.

9. **To install the new CPU VRM, press it into the empty socket until it snaps into place, ensuring that the notch in the CPU VRM aligns with the key in the connector.**

10. ***(Updated release of Sun Fire V40z server only)* Reposition the wire clip to secure the CPU VRM in place.**

    a. **With your index fingers, gently lift up on either side of the horizontal section of the wire clip, and reposition it over the top of the VRM.**

11. **Replace the CPU card into the server (see** FIGURE 4-18**):**

    a. **Carefully align the rear corners of the CPU card with the plastic alignment tracks inside the server chassis, then slide the CPU card into the tracks.**

    b. **Press in firmly and evenly on both corners of the CPU card until it engages the backplane.**

    c. **Lock down the two plastic latches on the corners of the CPU card to secure it in place.**

12. **Close the CPU card door.**

13. **Replace the front bezel onto the server.**

4.5.11 Memory Modules

The Sun Fire V40z server contains memory modules in four memory-bank locations. Two banks are on the motherboard and two banks are on the optional CPU card. Use the correct procedure in this section:

- "Replacing a Memory Module on the Motherboard" on page 4-51
- "Replacing a Memory Module on the CPU Card" on page 4-52

4.5.11.1 Memory Module Population Rules

Use the following information and rules when you use the procedures in this section to replace or add dual inline memory modules (DIMMs) to the server.

- DIMMs used in the server must all be of the same type: "Registered DDR 333" or "Registered DDR 400".

Caution – The Registered DDR 400 memory DIMMS can only be used in the updated release (chassis PN 380-1206) of the Sun Fire V40z server.

If you are installing the new Registered DDR 400 memory DIMMs in your server, you must also install the new 2.6V voltage-regulator module (VRM) (PN 370-7747).

Note – If you mix two different types of DIMM, the memory clocks down to the lower speed. Sun Microsystems, Inc. does not support this configuration.

Note – A maximum of 6 GB of memory per CPU is currently supported in the Sun Fire V20z server at DDR 400 speed: two 2-GB DIMMs and two 1-GB DIMMS. In this case, you must insert the 2-GB DIMMs in the bank next to the CPU and the 1-GB DIMMs in the outer bank.

If more than 6 GB of DDR 400 memory is installed per CPU (meaning, 2-GB DIMMs in all four memory slots), the system will access at the memory only at DDR 333 speed.

- Four DIMMs are supported per CPU. The four DIMM slots for each CPU are grouped into two banks (bank 0 and bank 1) that contain two slots each.
- The Sun Fire V40z server supports either two- or four-CPU configurations. Each CPU can use two or four DIMMs; when using only two DIMMs for a CPU, populate the bank closest to the CPU first (bank 0) .
- DIMMs must be installed in matched pairs (one bank at a time). The two DIMMs in a bank must be of the same size, type and vendor.

- Each CPU can support two banks of DIMMs. While each bank must contain a pair of matching DIMMs, the size and vendor of the DIMMs between bank 0 and bank 1 do not have to match.
  - For example, TABLE 4-1 shows some valid sample configurations for CPU0. In each example, DIMM 0 and DIMM 1 match in size (and vendor), but they do not have to match DIMM 2 and DIMM 3. DIMM 2 and DIMM 3 must match within their bank, but they do not have to match DIMM 0 and DIMM 1.

TABLE 4-1 Sample of Valid DIMM Configurations

CPU 0	BANK 0	BANK 1
Example 1	DIMM 0 = 512, DIMM 1 = 512	DIMM 2 = 1GB, DIMM 3 = 1GB
Example 2	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 1GB, DIMM 3 = 1GB
Example 3	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 512
Example 4	DIMM 0 = 2GB, DIMM 1 = 2GB	DIMM 2 = 512, DIMM 3 = 512

- The sample configurations in TABLE 4-2 are *not* valid because in each case, at least one of the banks contains mismatched DIMM pairs.

TABLE 4-2 Sample of Non-Valid DIMM Configurations

CPU 0	BANK 0	BANK 1
Example 1	DIMM 0 = 512, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 512
Example 2	DIMM 0 = 1GB, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 2GB
Example 3	DIMM 0 = 2GB, DIMM 1 = 2GB	DIMM 2 = 512, DIMM 3 = 1GB
Example 4	DIMM 0 = 512, DIMM 1 = 1GB	DIMM 2 = 512, DIMM 3 = 1GB

4.5.11.2 Replacing a Memory Module on the Motherboard

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Remove the rear fan-cage assembly. Squeeze the retainer clips on each end of the fan cage inward (see** FIGURE 4-25**).**

4. **Pull straight up on the fan-cage assembly to disengage it from the motherboard connector.**

5. **Lift the assembly up and out of the server.**

6. **Locate the memory-module connector in which you will install or replace a memory module.**

   Note – For the memory modules next to CPU1 (from the front of the server, CPU1 is on the right side), first remove fan 12 and the plastic air baffle to obtain easier access to the ejector bars.

   ---

7. **Remove a memory module by pressing down on the ejector bars at both ends of the memory module's socket (see** FIGURE 4-31**).**

8. **Ensure that the memory-module socket's ejector bars are open (rotated outward) to allow the new module to be inserted.**

9. **Align the memory module's edge connector with the alignment key and insert the memory module into the connector.**

10. **If you removed fan 12 and the plastic air baffle (see Step 6), replace the fan and plastic air baffle now.**

11. **Re-install the rear fan-cage assembly.**

12. **Replace the main air baffle.**

13. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

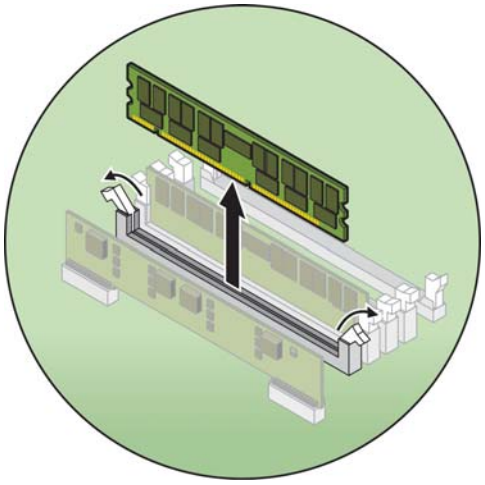

FIGURE 4-31 Removing a Memory Module

4.5.11.3 Replacing a Memory Module on the CPU Card

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

   It is not necessary to remove the cover for this procedure.

2. **Remove the front bezel from the server by pressing in on the rubberized buttons on each side of the bezel, then swinging the bezel top downward (see** FIGURE 4-15**).**

3. **Open the CPU card door, which is located under the hard drive bays, to access the CPU card. Press in the two buttons on the door and swing it downward so that it is open 180 degrees from the closed position (see** FIGURE 4-16**).**

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

4. **Open the two plastic levers on the CPU card corners *simultaneously* to release it from its backplane, then carefully pull it out of the server (see** FIGURE 4-17**).**

5. **Set the CPU card on an ESD-resistant surface.**

6. **Locate the memory-module connector in which you will install or replace a memory module.**
7. **Remove a memory module by pressing down on the ejector bars at both ends of the memory module's socket (see** FIGURE 4-31**).**
8. **Ensure that the memory-module socket's ejector bars are open (rotated outward) to allow the new module to be inserted.**
9. **Align the memory module's edge connector with the alignment key and insert the memory module into the connector.**

Note – Refer to "Memory Module Population Rules" on page 4-49 for important information about DIMM requirements.

---

10. **Replace the CPU card into the server (see** FIGURE 4-18**):**
    a. **Carefully align the rear corners of the CPU card with the plastic alignment tracks inside the server chassis, then slide the CPU card into the tracks.**
    b. **Press in firmly and evenly on both corners of the CPU card until it engages the backplane.**
    c. **Lock down the two plastic latches on the corners of the CPU card to secure it in place.**
11. **Close the CPU card door.**
12. **Replace the front bezel onto the server.**

4.5.12 CPUs and Heatsinks

Caution – In a two- or four-CPU configuration of the Sun Fire V40z server, all CPUs must be the same stepping version and the same speed. Before adding or replacing a CPU, ensure that you have read the information in "No Mixing of CPU Stepping Versions" on page 4-8.

The Sun Fire V40z server supports two- or four-CPU configurations. In a two-CPU configuration, you must use the two motherboard positions (CPU0 and CPU1). Four CPUs are supported with two on the motherboard and two on the CPU card (CPU2 and CPU3). Use the correct procedure in this section:

- "Replacing a CPU on the Motherboard" on page 4-54
- "Replacing a CPU on the Optional CPU Card" on page 4-58

4.5.12.1 Replacing a CPU on the Motherboard

Removing the CPU and Heatsink

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

3. **Remove fans 9 through 11 from the front fan-cage assembly to provide clearance.**

   Squeeze the retainer clip on the edge of the fan, then pull the fan straight up to disengage its connector and remove it from its fan cage (see FIGURE 4-23).

Note – For fans 9 through 12, the numbers are imprinted on the plastic of the main air baffle.

---

4. **Remove the rear fan-cage assembly to provide clearance.**

   Squeeze the retainer clips on each end of the fan cage inward (see FIGURE 4-25), then pull straight up on the fan-cage assembly to disengage it from the motherboard connector.

5. **Loosen the captive screw that secures the heatsink hold-down assembly crossbar, then remove the crossbar from within the heatsink fins (see** FIGURE 4-32**).**

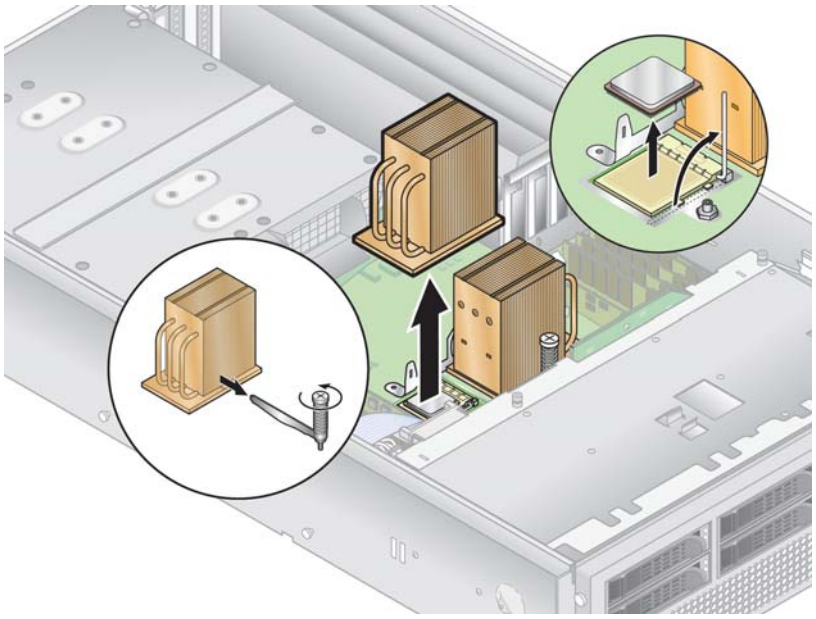

FIGURE 4-32 Removing the Heatsink and CPU

Caution – The heatsink can become extremely hot. Be sure it has had sufficient time to cool before handling.

6. **Twist the heatsink slightly to the right or left to break the seal with the thermal grease, then lift the heatsink away from the CPU.**
7. **Use an alcohol pad to remove all thermal grease from the bottom of the heatsink.**

   Be careful not to get any thermal grease on your fingers. It is very sticky and you may contaminate other components when handling them.
8. **Place the heatsink upside-down on a flat surface to prevent the thermal grease from contaminating other components.**
9. **Pull the socket release lever up to the fully open, perpendicular position (see** FIGURE 4-32**).**
10. **Lift the CPU out of the socket, leaving the release lever in the open position.**

Caution – Ensure that any thermal grease that might remain from the heatsink does not come into contact with the CPU socket or pins.

Installing a CPU and Heatsink

1. **Unpack the new CPU.**

Caution – Observe the appropriate ESD precautions.

2. **Ensure that the socket release lever is in the fully open, perpendicular position (see** FIGURE 4-33**).**

3. **Align the small triangle, on the corner of the CPU, with the triangle on the corner of the socket.**

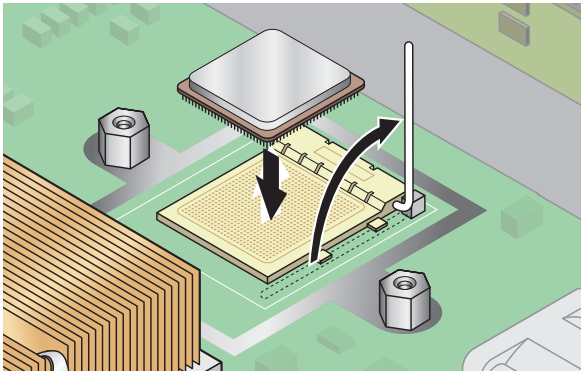

FIGURE 4-33 Installing a CPU in its Socket

4. **Insert the CPU into the socket.**

Caution – If correctly aligned, the CPU should easily insert into the socket. If more than minimal resistance is felt, stop and recheck the alignment. Forcing a misaligned CPU into the socket will permanently damage the device.

5. **When the CPU is fully seated in the socket, rotate the socket release lever down until it snaps into place, securing the CPU in the socket (see** FIGURE 4-33**).**

6. **Use the syringe to apply approximately 0.1 ML/CC of thermal grease in a circular pattern to the top of the CPU.**

7. **Gently distribute the thermal grease and remove any excess so that only an extremely thin, uniform layer remains. If any voids or crevices appear that could lead to air pockets, reapply the grease until you achieve a thin but compact consistency.**

8. **Inspect the heatsink for dust and lint. Clean again if necessary.**

9. **Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.**

   The cooling pipes on the heatsink should be facing toward the outside of the machine.

Caution – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

10. **After the heatsink is correctly aligned, reinsert the hold-down assembly crossbar through the heatsink fins (see** FIGURE 4-34**):**

    a. **Insert the crossbar from the front side of the heatsink and align it with the alignment mark on the base of the heatsink.**

    b. **Push the crossbar through the heatsink fins and insert the crossbar end into the tab on the hold-down assembly.**

    c. **Tighten the captive screw that secures the crossbar.**

11. **Replace the rear fan-cage assembly.**

12. **Replace fans 9 through 11 to the front fan-cage assembly.**

13. **Replace the main air baffle.**

14. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

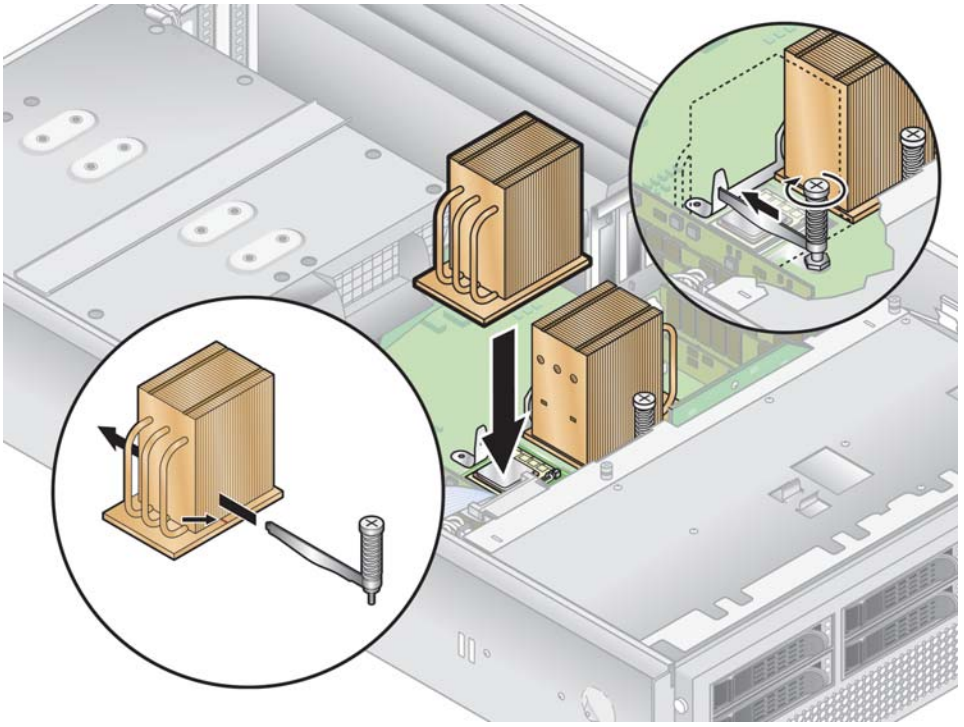

FIGURE 4-34 Replacing the Heatsink Hold-Down Assembly Crossbar

4.5.12.2 Replacing a CPU on the Optional CPU Card

Removing a CPU and Heatsink

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

   It is not necessary to remove the cover for this procedure.

2. **Remove the front bezel from the server by pressing in on the rubberized buttons on each side of the bezel, then swinging the bezel top downward (see** FIGURE 4-15**).**

3. **Open the CPU card door, which is located under the hard drive bays, to access the CPU card. Press in the two buttons on the door and swing it downward so that it is open 180 degrees from the closed position (see** FIGURE 4-16**).**

Caution – The electronic components and solder joints on the bottom of the CPU card are fragile. Use care to avoid scraping the bottom of the CPU card on the chassis or door when removing or installing it.

4. **Open the two plastic levers on the CPU card corners *simultaneously* to release it from its backplane, then carefully pull it out of the server (see** FIGURE 4-17**).**
5. **Set the CPU card on an ESD-resistant surface.**
6. **Unscrew the heatsink from the motherboard.**

   a. **For a heatsink installed on an auxiliary CPU card in the original release (chassis PN 380-1010) of the Sun Fire V40z server (for CPUs of stepping versions "C0" and "CG"):**

      Unfasten the two securing screws and remove the heatsink securing clip. **See** FIGURE 4-35**.**

   b. **For a heatsink installed in the updated release (chassis PN 380-1206) of the server (for CPUs of stepping versions "E"):**

      Loosen the screws evenly on each side of the heatsink. Remove the screws and captive springs that secure the heatsink (the washers remain fixed to the surface of the heatsink). See FIGURE 4-36.

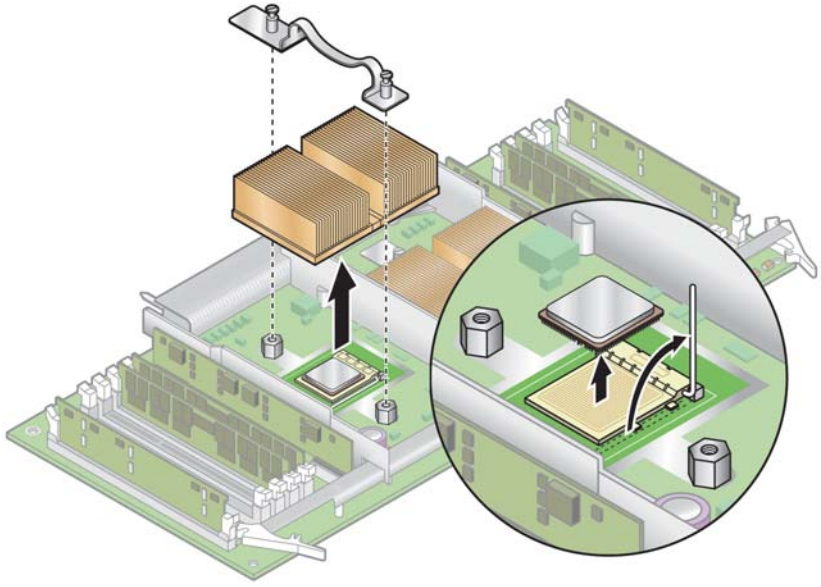

FIGURE 4-35 Removing the Securing Clip and Heatsink for Stepping Versions "C0" and "CG" CPUs

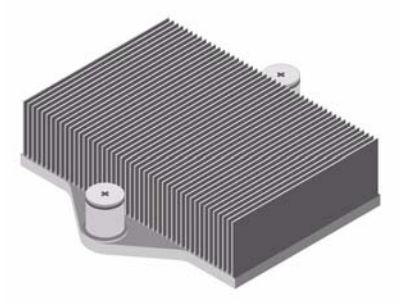

FIGURE 4-36 Heatsink for Stepping Version "E" CPU

Caution – The heatsink can become extremely hot. Be sure it has had sufficient time to cool before handling.

7. **Twist the heatsink slightly to the right or left to break the seal with the thermal grease.**
8. **Lift the heatsink away from the CPU.**
9. **Use an alcohol pad to remove all thermal grease from the bottom of the heatsink.**

   Be careful not to get any thermal grease on your fingers. It is very sticky and you may contaminate other components when handling them.
10. **Place the heatsink upside-down on a flat surface to prevent the thermal grease from contaminating other components.**
11. **Pull the socket release lever up to the fully open, perpendicular position (see** FIGURE 4-35**).**
12. **Lift the CPU out of the socket, leaving the release lever in the open position.**

Caution – Ensure that any thermal grease that might remain from the heatsink does not come into contact with the CPU socket or pins.

Installing a CPU and Heatsink

1. **Unpack the new CPU.**

Caution – Observe the appropriate ESD precautions.

2. **Ensure that the socket release lever is in the fully open, perpendicular position (see** FIGURE 4-37**).**

3. **Align the small triangle on the corner of the CPU with the triangle on the corner of the socket.**

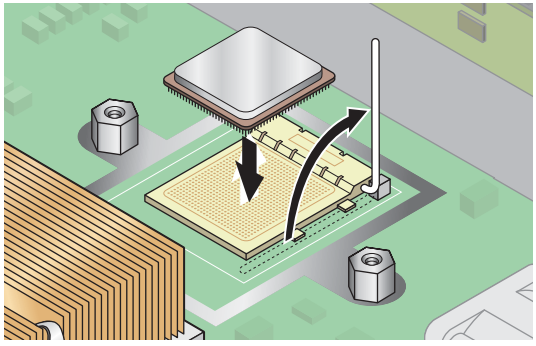

FIGURE 4-37 Installing a CPU in its Socket

4. **Insert the CPU into the socket.**

Caution – If correctly aligned, the CPU should easily insert into the socket. If more than minimal resistance is felt, stop and recheck the alignment. Forcing a misaligned CPU into the socket will permanently damage the device.

5. **When the CPU is fully seated in the socket, rotate the socket release lever down until it snaps into place, securing the CPU in the socket.**

6. **Use the syringe to apply approximately 0.1 ML/CC of thermal grease in a circular pattern to the top of the CPU.**

7. **Gently distribute the thermal grease and remove any excess so that only an extremely thin, uniform layer remains. If any voids or crevices appear that could lead to air pockets, reapply the grease until you achieve a thin but compact consistency.**

8. **Inspect the heatsink for dust and lint. Clean again if necessary.**

9. **Carefully position the heatsink on the CPU, aligning it with the mounting posts to reduce movement after it makes initial contact with the layer of thermal grease.**

Caution – If the heatsink is moved too much during its installation, the layer of thermal grease may become uneven, leading to component damage.

10. **According to the type of heatsink that you have, after the heatsink is correctly aligned:**

    a. **Re-install the heatsink clips so that the longer tab points toward the fans.**

    b. **Tighten the clip-securing screws.**

    OR

Caution – Tighten the screws evenly on each side of the heatsink. If you completely tighten the screw on one side first, you may damage the CPU underneath.

    a. **Re-insert the screws and and captive springs.**

    b. **Tighten the screws.**

11. **Replace the CPU card into the server (see** FIGURE 4-18**):**

    a. **Carefully align the rear corners of the CPU card with the plastic alignment tracks inside the server chassis, then slide the CPU card into the tracks.**

    b. **Press in firmly and evenly on both corners of the CPU card until it engages the backplane.**

    c. **Lock down the two plastic latches on the corners of the CPU card to secure it in place.**

12. **Close the CPU card door.**

13. **Replace the front bezel onto the server.**

4.5.13 System Battery

The system battery is a common CR2032 calculator battery.

You might need to replace the system battery if you know it is weak or if after any period of AC power loss, the BIOS loses its CMOS settings or if the time-of-day clock loses time.

Note – Removing the battery causes the server to revert to the factory default BIOS settings, regardless of how the server boot options have been set up using the System Setup Utility or the BIOS setup.

Caution – Do not attempt to open or service batteries. The battery contains lithium and can explode if not properly used, handled or disposed of.

---

1. **Power off the system and remove the cover as described in "Powering Off the Server and Removing the Cover" on page 4-2.**
2. **Remove the power-supply cage assembly: see "Replacing a Power-Supply Cage Assembly" on page 4-39.**
3. **Remove the system battery by sliding it back and prying it from the holder (see** FIGURE 4-38 **for the location).**

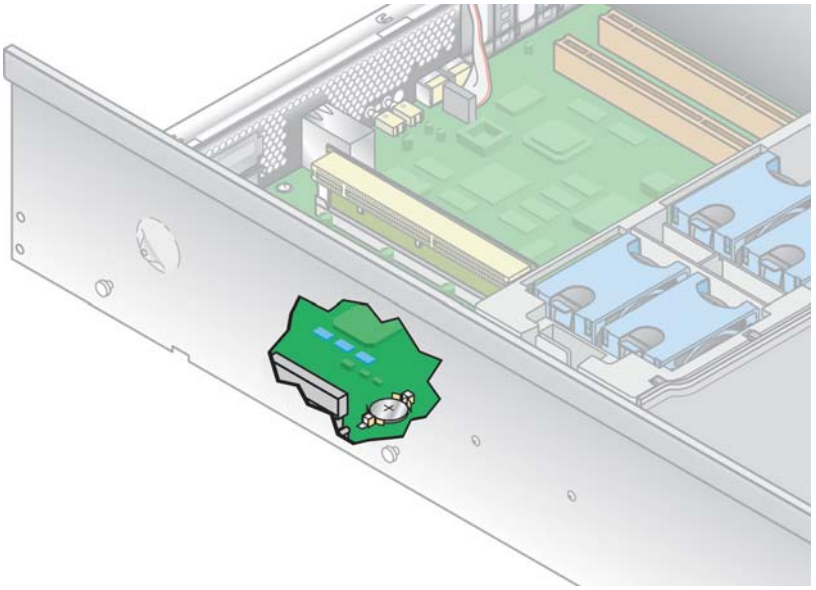

FIGURE 4-38 Removing the System Battery

Caution – Do not dispose of the battery with regular waste. Discard used batteries according to the manufacturer's instructions or contact your local waste-disposal agency for the location of the nearest battery deposit site.

---

4. **Install the new system battery into the holder with the side labeled "+" facing up.**

Note – Replace the battery only with the identical model.

---

5. **Re-install the power-supply cage assembly: see "Replacing a Power-Supply Cage Assembly" on page 4-39.**
6. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.14 Cable Kit

Note – The chassis part number (PN) is labelled on the front panel of the server, near the DVD-ROM/Diskette Drive assembly.

The following procedure describes how to remove and replace the following cables:

- Operator-panel board cable
- DVD-ROM/Diskette drive assembly cable
- Internal USB cable
- SCSI backplane power cable
- SCSI signal cable

Note – The cable kit for the Sun Fire V40z server contains two SCSI signal cables:

a. The longer cable is used on the original release of the server (chassis part number [PN] 380-1010). Only a qualified technician should replace the SCSI signal cable on the original release, as it involves removing all components and the motherboard from the chassis.

b. The shorter cable is used on the updated release of the server (chassis PN 380-1206). This cable is now routed above the motherboard and can be replaced by customers.

Note – To identify the version of your server, the chassis PN is labelled on the front panel of the server, by the DVD-ROM/Diskette Drive assembly.

4.5.14.1 Remove System Components

Depending on the cable that you want to replace, you need to remove various system components for access to the system cables.

For the operator-panel board cable, the internal USB cable and the DVD-ROM/Diskette drive assembly cable, you should remove the following components:

- main air baffle
- rear fan-cage assembly
- PCI option cards installed in the vertical PCI slots
- black plastic air-baffle cage around the vertical PCI slots
- fan 12 (in the front fan-cage assembly) and its plastic air baffle

For the SCSI backplane power cable and the SCSI signal cable, you should remove the following components:

- main air baffle
- rear fan-cage assembly
- individual power supplies and power-supply cage assembly

Refer to the sub-section in the procedure for the components to remove and for each type of system cable to replace.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

2. **Remove the main air baffle (see** FIGURE 4-20**).**

   Lift the rear edge of the baffle, then move it toward the rear of the server to disengage the hooks on the front edge of the baffle.

Rear Fan-Cage Assembly

3. **Remove the rear fan-cage assembly. Squeeze inward the retainer clips on each end of the rear fan-cage assembly (see** FIGURE 4-25**).**
4. **Pull straight up on the fan-cage assembly to disengage it from the motherboard connector.**
5. **Lift the assembly up and out of the server.**

Individual Power Supply

6. **Remove the individual power supplies. At the outside rear of the server, pull the finger-ring on the power-supply handle toward you to disengage the power-supply connector from the power distribution backplane (see** FIGURE 4-26**).**

Note – A twisted, plastic tie-wrap through the finger ring holds the power-supply handle in place. Untwist this tie-wrap to pull the handle out.

---

7. **Slide the power supply out of the power-supply cage and chassis.**

Power-Supply Cage Assembly

8. **Remove the power-supply cage assembly. Pull the metal handle on the top of the cage toward the front of the server so that the hinged cams lift the cage and disconnect it from the motherboard (see** FIGURE 4-27**).**

9. **Lift the front of the cage and disengage its metal tabs from their mounting holes on the server back panel to remove it from the chassis.**

PCI Option Cards

10. **Remove any PCI option cards installed in the vertical slots, using one of the following two methods (depending on the slot from which you are removing you are installing to:**
    - If you are removing a card in a slot that has a mechanical retention latch (MRL), push the button on the end of the MRL and lift the MRL flap (see FIGURE 4-6).
    - If you are removing a card in a slot that does not have an MRL, remove the securing screw and the retaining bracket from the slot (see FIGURE 4-7).

11. **Remove the PCI option card.**

    Repeat these steps for each PCI option card installed in a vertical PCI slot.

Plastic Air-Baffle Cage

12. ***(Updated Release of V40z server only [chassis PN 380-1206])* A black plastic air-baffle cage has been added and replaces the individual air-baffle inserts.**

    Remove the four screws that fasten the air-baffle cage to the motherboard, and remove the card cage.

4.5.14.2 Remove and Replace the Cables

You are now ready to remove and replace the system cables. Identify the cable to be replaced (see FIGURE 4-39 for the location).

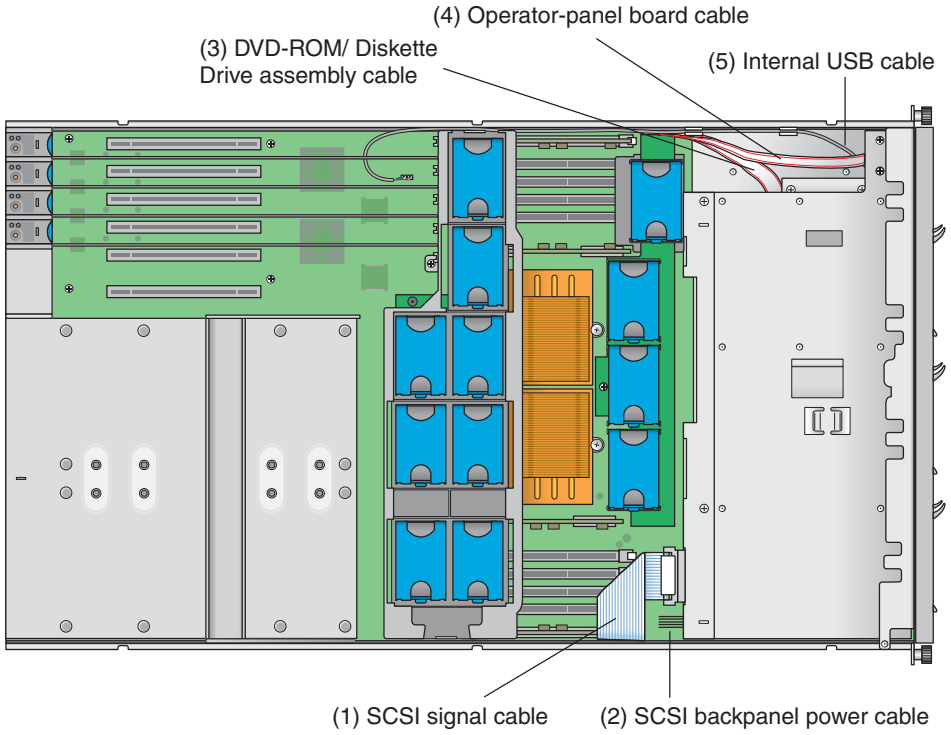
(4) Operator-panel board cable
(3) DVD-ROM/ Diskette Drive assembly cable
(5) Internal USB cable
(1) SCSI signal cable
(2) SCSI backpanel power cable

FIGURE 4-39 System Cables in the Sun Fire V40z Server

Refer to FIGURE 4-40 for the methods used to release cables from the various types of connectors.

Caution – Use caution when removing cables because connectors and pins are very fragile and can be damaged.

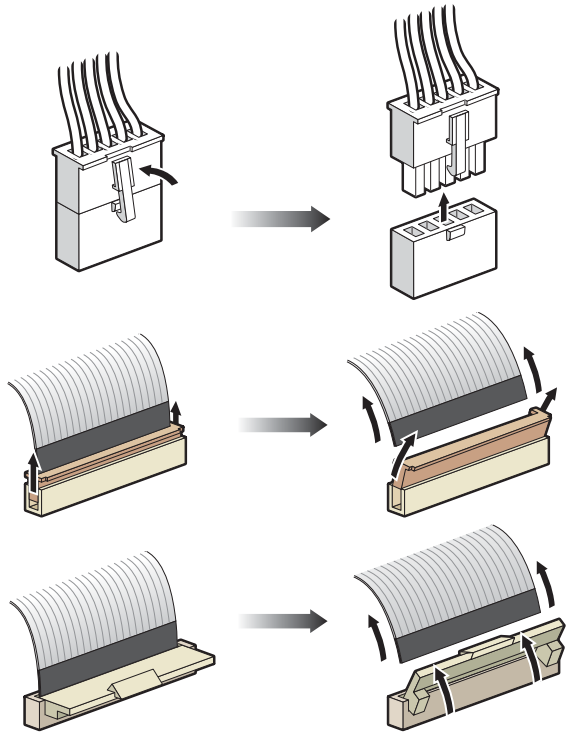

FIGURE 4-40 Types of Cable Connector

SCSI Signal Cable and Power Cable

Note – This procedure applies only to the SCSI signal cable in the updated release of the Sun Fire V40z server (chassis PN 380-1206).

Do not attempt to replace the SCSI signal cable on the original release of the server (chassis PN 380-1010).

1. **Disconnect the SCSI signal cable (1) from the SCSI backplane and from the motherboard.**
2. **Connect the new SCSI signal cable to the SCSI backplane and the motherboard, according to the markings on the cable.**

   If you have no other cables to replace, jump to "Re-install the Components" on page 4-73. Otherwise, continue in the procedure with your next type of cable.
3. **Disconnect the SCSI power cable (2) from the SCSI backplane and from the motherboard.**
4. **Connect the new SCSI power cable to the SCSI backplane and the motherboard, according to the markings on the cable.**

   If you have no other cables to replace, jump to "Re-install the Components" on page 4-73. Otherwise, continue in the procedure with your next type of cable.

DVD-ROM/Diskette Drive Assembly Cable

Note – This cable consists of two separate cables for the signals which are joined at each end into one connector.

---

1. **Remove the metal PCI bracket guide. Unscrew the two screws that fasten the PCI bracket guide to the motherboard and server chassis. Lift the bracket guide up and out of the chassis.**

   This bracket guide keeps full-length PCI cards in place.
2. **Slide the plastic air baffle up and off from the base of fan 12.**

Note – For the front fans, the fan numbers are imprinted on the main air baffle that normally sits on top of the front fan-cage assembly.

---

3. **Remove fan 12. Squeeze the retainer clip on the edge of the fan, then pull the fan straight up to disengage its connector and remove it from the fan cage.**
4. **Disconnect the DVD-ROM/Diskette Drive cable (3) from the motherboard (by the vertical PCI slots).**
5. **Remove the service loop for the flat cables from the plastic retainer clip on the chassis wall.**
6. **Press the plastic latch on front left side of DVD-ROM/Diskette Drive assembly.**
7. **Gently pull the assembly out of the bay while feeding the cables through the rear of the bay (see** FIGURE 4-14**).**

8. **Disconnect the cables from the assembly.**
9. **Remove the cables from the bay and chassis.**
10. **Feed the new cables through the empty bay, with the end labelled "Motherboard" toward the rear of the chassis.**
11. **Connect the new cables to the assembly.**
12. **Slide the assembly back into the bay, while pulling the cables back into the chassis through the rear opening of the bay.**
13. **Push the assembly in until the latch clicks into the front panel.**
14. **Re-seat the service loop for the flat cables into the plastic retainer clip on the chassis wall.**

    If you have no other cables to replace, jump to “Repositioning the Cables” on page 4-72. Otherwise, continue in the procedure with your next type of cable.

Operator-Panel Board Cable and USB Cable

Note – There are two separate cables that connect to the rear of the operator-panel board: the operator-panel cable and the USB cable.

---

1. **Remove the metal PCI bracket guide. Unscrew the two screws that fasten the PCI bracket guide to the motherboard and server chassis. Lift the bracket guide up and out of the chassis.**

   This bracket guide keeps full-length PCI cards in place.
2. **Slide the plastic air baffle up and off from the base of fan 12.**

Note – For the front fans, the fan numbers are imprinted on the main air baffle that normally sits on top of the front fan-cage assembly.

---

3. **Remove fan 12. Squeeze the retainer clip on the edge of the fan, then pull the fan straight up to disengage its connector and remove it from the fan cage.**
4. **Disconnect the operator-panel cable (4) and the USB cable (5) from the motherboard (by the vertical PCI slots).**
5. **Remove the service loop for the flat cables from the plastic retainer clip on the chassis wall. Remove the USB cable from its plastic retainer clips.**

6. **Remove the screws that secure the operator-panel assembly in place: there are two screws on top and one captive screw inside the chassis, just behind the assembly (see** FIGURE 4-19**).**
7. **Slide the operator-panel assembly through the front panel of the server.**
8. **Disconnect the operator-panel cable and the USB cable from the assembly.**
9. **Remove the cables from the chassis.**
10. **Feed the new cables through the opening in the front panel, with the ends of each cable labelled "Motherboard" toward the rear of the chassis.**
11. **Connect the new operator-panel cable and the USB cable to the assembly.**
12. **Slide the assembly into the opening, while pulling the cables back into the chassis.**
13. **Push the assembly in until the top screw holes line up.**
14. **With the three screws, re-attach the assembly to the chassis.**
15. **Re-seat the service loop for the flat cables into the plastic retainer clip on the chassis wall.**
16. **Re-seat the USB cable in its plastic retainer clips on the wall.**

    If you have no other cables to replace, jump to “Repositioning the Cables” on page 4-72. Otherwise, continue in the procedure with your next type of cable.

Repositioning the Cables

This section is for the the operator-panel board cable, the internal USB cable and the DVD-ROM/Diskette drive assembly cable.

Caution – Ensure that you do not damage the memory voltage-regulator module (VRM) when you are re-installing the PCI bracket guide.

---

1. **Lay the cables flat against the chassis wall, outside of the memory VRM on that side.**
2. **Connect the new cables to the motherboard.**

3. **Re-install the PCI bracket guide in the chassis.**

   a. **Flat Cables: Lay the flat cables against the chassis wall with the bracket guide over them, holding the cables against the wall.**

   b. **USB Cable: Run the USB cable outside of the bracket guide, and feed it through the notch at the bottom corner, so that it can pass to the rear of the chassis.**

Note – Ensure that you feed the USB cable through the notch. Do not feed it through any of the four large vertical PCI openings.

---

4. **With the two screws, re-attach the PCI bracket guide to the chassis wall and to the motherboard. Do not tighten the screws yet.**

5. **While the bracket guide is still loose, pull the excess cable length toward the open space next to the DVD-ROM bay and operator-panel assembly, at the front of the server.**

   Keep the cable flat along the chassis wall next to the memory VRM.

6. **Tighten the two screws on the PCI bracket guide.**

4.5.14.3 Re-install the Components

Refer to the relevant sections in this procedure to re-install any other components that you removed.

Before re-installing the components, check the routing of all cables for obstructions.

1. ***(optional)*** **If you removed fan 12:**

   a. **Slide the plastic air baffle onto fan 12 and down to the base.**

   b. **Align the fan with the bay in the fan cage and push down firmly and evenly on both top corners of the fan to engage it with the cage connector.**

Caution – Ensure that the fan airflow direction is correct (front to rear) by installing the fan so that the airflow direction arrow points towards the rear of the chassis. After installing a new fan, allow sufficient time for the system to recognize the fan and to determine whether it is functioning properly.

Plastic Air-Baffle Cage

2. **Re-position the air-baffle cage on the motherboard and re-attach it with the four screws.**

PCI Option Cards

3. **Insert the new card into the slot. Push down evenly on both corners of the card to ensure it is seated correctly.**
4. **Secure the PCI card using one of the following two methods:**
   - If the slot has an MRL, close the MRL and push down on it until it clicks (refer back to FIGURE 4-6).
   - If the slot does not have an MRL, replace the retaining bracket and its single securing screw to the top of the card (refer back to FIGURE 4-7).

Power-Supply Cage Assembly

5. **To install the new power-supply cage assembly (refer back to FIGURE 4-27):**
   a. **Insert the assembly into the chassis with the rear of the assembly angled downward and the assembly handle in the fully open position.**
   b. **Carefully insert the metal tabs on the rear of the assembly into their slots on the chassis back panel.**
   c. **With the tabs in place, set the front of the assembly down on the motherboard connector.**
   d. **Press the metal handle on the top of the assembly down until the connectors on the motherboard engage with the assembly backplane.**

Individual power supply

6. **To re-install the power supplies (refer back to** FIGURE 4-26**):**

Caution – You must open the power supply's handle before you insert it into the power-supply cage. If the handle is left closed, it will deform the metal to which it latches.

Also, failure to open the power-supply handle only partially engages the power supply's connector, which can cause the power-reset sequence (PRS) code to enter a failed state. If this happens, the system-fault LED on the front panel will blink twice per second.

To recover a system in this bad PRS state:
1) Disconnect all AC power and reseat all power supplies.
2) Wait five minutes.
3) Reconnect AC power cords to all power supplies.

---

   a. **Open the power-supply handle to the fully open position, as shown in** FIGURE 4-26**.**

   b. **Insert the power supply into the power-supply cage and push it inward until it stops at the backplane.**

   c. **Push the power-supply handle closed until it locks into place.**

Rear Fan-Cage Assembly

7. **Align the fan cage with the chassis and push down on both ends of the fan cage until both retaining clips click securely into place and the fan-cage connector fully engages with the motherboard connector.**

   Refer back to FIGURE 4-25.

8. **Replace the main air baffle (refer back to** FIGURE 4-20**).**

9. **Before re-installing the cover on the server, check the routing of all cables for obstructions.**

4.5.15 Super FRU

Caution – Only a qualified technician is allowed to perform this procedure. This package is not a customer-replaceable unit (CRU).

Refer to the Service Label, on the inside of the chassis cover, for the location of the components.

The Super FRU is a chassis containing the motherboard and certain customer-replaceable units (CRUs). To install a Super FRU, you must remove all of the CRUs from the old chassis. Then, re-install each of those components in the new Super FRU chassis.

Note – The Sun Fire V40z Super FRU ships with the following components installed: the PCI riser, the SCSI backplane assembly, the rear fan-cage assembly and the operator-panel assembly.

You must remove all other CRUs from your old chassis and re-install them in the new chassis. This includes the system cables.

1. **Power off the server, including any attached peripherals, and disconnect the server from the electrical outlet. If your server includes two power supplies, ensure that both power cords are disconnected from the electrical outlet.**

   Refer to "Powering Off the Server and Removing the Cover" on page 4-2.

   Some procedures might not require you to remove the cover. Refer to the individual instructions as indicated.

2. **Remove the following components and transfer them to the new Super FRU chassis.**

   Refer to the appropriate instructions in this chapter to remove and replace each component. Also refer to FIGURE 4-2 for component locations.

   - PCI Card(s) (see "PCI Card" on page 4-13)
   - Hard Disk Drives and Carriers (see "SCSI Hard Disk Drive and Carrier" on page 4-21)
   - DVD-ROM/Diskette Drive Assembly (see "DVD-ROM/Diskette Drive Assembly" on page 4-24)
   - CPU Card (optional) (see "CPU Card" on page 4-25)
   - Individual Cooling Fans (see "Replacing an Individual Cooling Fan" on page 4-32)
   - Front fan-cage assembly (see "Replacing the Front Fan-Cage Assembly" on page 4-34)
   - Memory VRMs (on motherboard and CPU card) (see "Memory Voltage-Regulator Modules" on page 4-41)

- CPU VRMs (on motherboard and CPU card) (see "CPU Voltage-Regulator Modules" on page 4-44)
- Memory Modules (on motherboard and CPU card) (see "Memory Modules" on page 4-49)
- CPUs and Heatsinks (on motherboard and CPU card) (see "CPUs and Heatsinks" on page 4-53)
- Power Supplies (see "Replacing an Individual Power Supply" on page 4-37)
- Power-Supply Cage Assembly (see "Replacing a Power-Supply Cage Assembly" on page 4-39)
- System Battery (see "System Battery" on page 4-63)
- System Cables (see "Cable Kit" on page 4-65)

Note – For the original release (chassis PN 380-1010) of the Sun Fire V40z server, you do not need to remove the SCSI signal cable from the old chassis. This cable is installed in the Super FRU chassis as part of the SCSI backplane assembly.

For the updated release (chassis PN 380-1206) of the server, you will remove and re-install this cable along with the other system cables.

4.6 Sun Fire V40z Indicators, Switches and Jumpers

4.6.1 Sun Fire V40z Motherboard and CPU Card

FIGURE 4-41 shows the locations of the activity indicator LEDs and the Clear-CMOS jumper on the motherboard and the optional CPU card. TABLE 4-3 defines the component to which each fault indicator LED corresponds.

Jumper J125, the clear-CMOS jumper, is explained in "Clear-CMOS Jumper" on page 4-80.

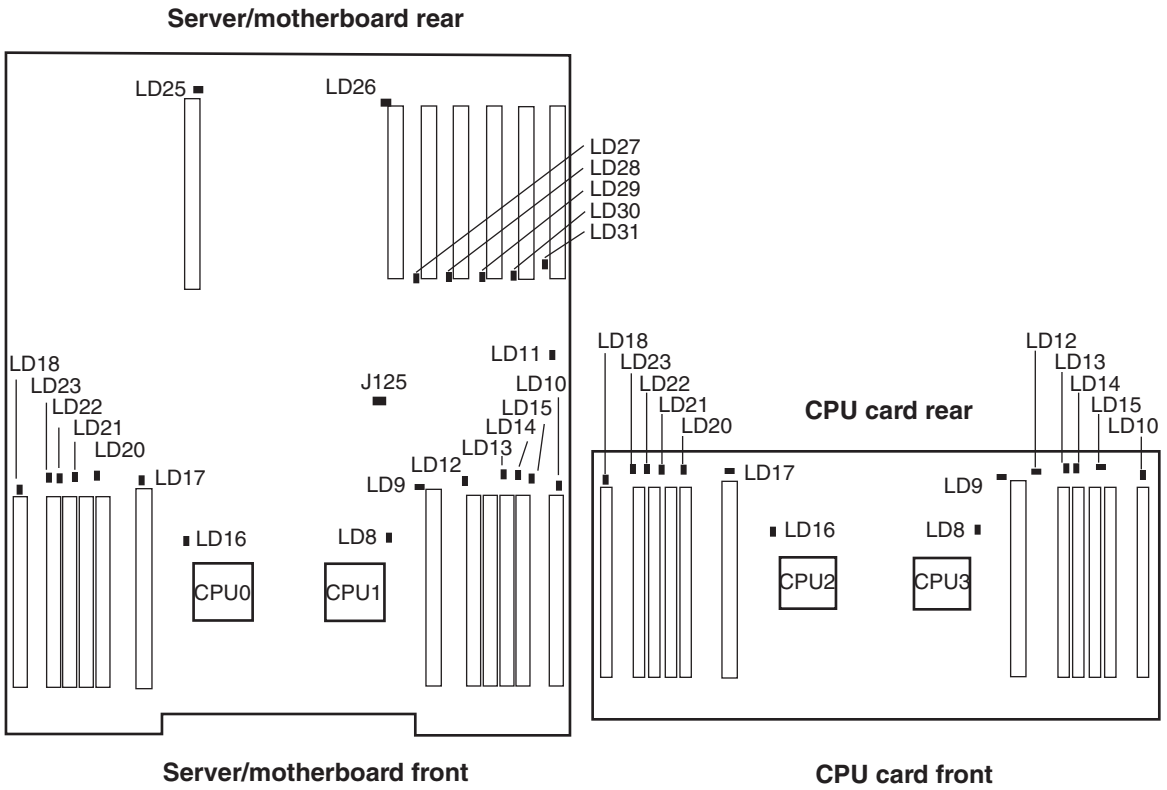

FIGURE 4-41 Sun Fire V40z Motherboard, Showing LED Locations

TABLE 4-3 defines the activity indicators that are shown in FIGURE 4-41. The LED numbers are intentionally duplicated between the motherboard and the CPU card.

Jumper J125, the clear-CMOS jumper, is explained in "Clear-CMOS Jumper" on page 4-80.

All other jumpers and switches are for internal factory troubleshooting and are intentionally not documented in this guide.

TABLE 4-3 Indicators on the Motherboard and CPU Card

Indicator Number	Component Activity Indicated
LD8	CPU1 or CPU3
LD9	CPU1 or CPU3 CPU VRM
LD10	CPU1 or CPU3 memory VRM
LD11	DVD drive
LD12	CPU 1 or CPU3 memory slot 0
LD13	CPU 1 or CPU3 memory slot 1
LD14	CPU 1 or CPU3 memory slot 2
LD15	CPU 1 or CPU3 memory slot 3
LD16	CPU0 or CPU2
LD17	CPU0 or CPU2 CPU VRM
LD18	CPU0 or CPU2 memory VRM
LD20	CPU0 or CPU2 memory slot 0
LD21	CPU0 or CPU2 memory slot 1
LD22	CPU0 or CPU2 memory slot 2
LD23	CPU0 or CPU2 memory slot 3
LD25	PCI slot 1
LD26	PCI slot 2
LD27	PCI slot 3
LD28	PCI slot 4
LD29	PCI slot 5
LD30	PCI slot 6
LD31	PCI slot 7

4.6.2 Clear-CMOS Jumper

The location of the Clear-CMOS jumper (J125) on the Sun Fire V40z motherboard is shown below. This jumper can be used to clear the CMOS if the server hangs during certain conditions.

- The default position for the jumper is pins 1+2, which is the setting for "Clear-CMOS-Removed." This setting retains CMOS settings on each reboot of the server.
- If you move the jumper to pins 2+3, this is the "Clear-CMOS-Installed" setting. This setting will clear the CMOS settings with each reboot of the server.

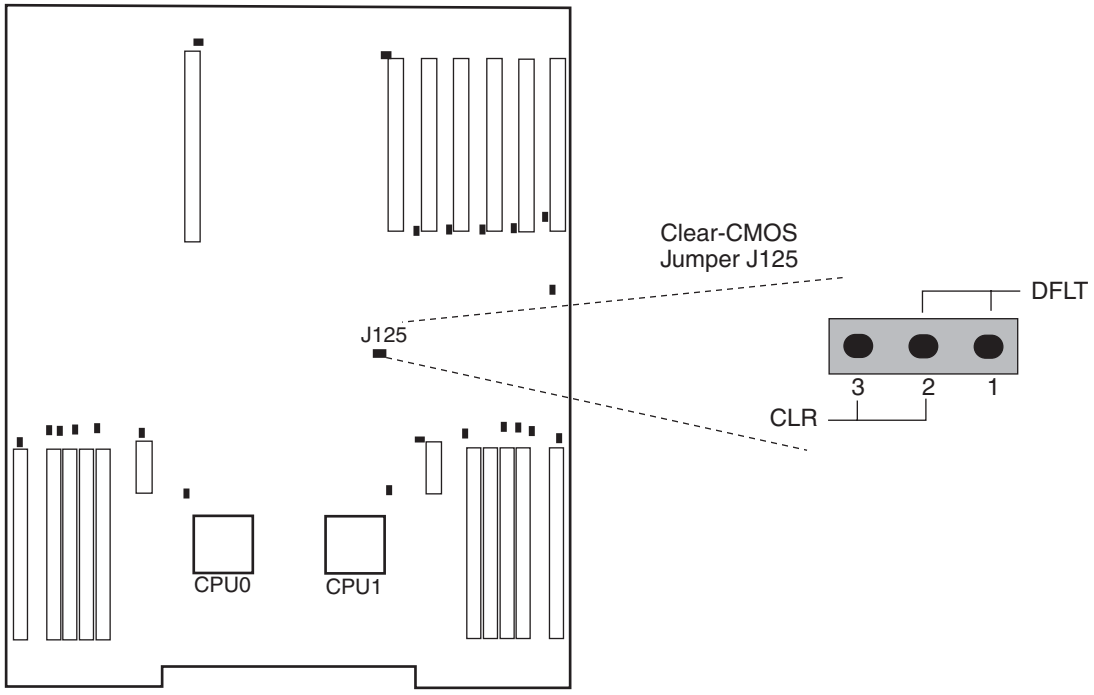

FIGURE 4-42 Sun Fire V40z Motherboard, Showing Clear-CMOS Jumper J125

APPENDIX **A**

System Specifications

To obtain maximum reliability and performance, install your server into a proper environment and ensure correct configuration as discussed in this chapter.

A.1 Sun Fire V20z Specifications

A.1.1 Sun Fire V20z Physical Specifications

TABLE A-1 Sun Fire V20z Server Physical Specifications

Specification	English	Metric
Width	16.94 in.	430.276 mm
Depth	28 in.	711.2 mm
Height	1.69 in.	42.93 mm
Weight (max.)	35 lbs	15.88 kg

A.1.2 Sun Fire V20z Power Specifications

TABLE A-2 Sun Fire V20z Server AC Input Specifications

Specification	Value
Universal AC Input	100 to 240 VAC, 50/60 Hz
Maximum current	7.0 amps

A.1.3 Sun Fire V20z Environmental Specifications

TABLE A-3 Sun Fire V20z Server Unit-Level Environmental Specifications

Specification	State	English	Metric
Temperature	Operating	50° to 95° F	10° to 35° C*
	Non-operating	-40° to 149° F	-40° to 65° C
Humidity	Operating	10% to 90% RH at 80. 6° F max. wet bulb (non-condensing)	10% to 90% RH at 27° C max. wet bulb (non-condensing)
	Non-operating	10% to 90% RH	10% to 90% RH
Altitude	Operating	Up to 9,800 feet	Up to 3,000 meters
	Non-operating	Up to 39,370 feet	Up to 12,000 meters
Vibration	Operating	.20 G, 5 to 500 Hz sine sweep	
Shock	Operating	5 G, 11 ms half-sine	

* The temperature specifications in this table are rated for sea level. For each rise of 300 meters in altitude, the maximum temperature drops by 1° C.

A.2 Sun Fire V40z Specifications

A.2.1 Sun Fire V40z Physical Specifications

TABLE A-4 Sun Fire V40z Server Physical Specifications

Specification	English	Metric
Width	19 in.	482.60 mm
Depth	28 in.	711.20 mm
Height	5.25 in.	133.35 mm
Weight (max.)	75 lbs	34.0 kg

A.2.2 Sun Fire V40z Power Specifications

TABLE A-5 Sun Fire V40z Server AC Input Specifications

Specification	Value
Universal AC Input	100 to 240 VAC, 47/63 Hz
Maximum current	10.0 amps

A.2.3 Sun Fire V40z Environmental Specifications

TABLE A-6 Sun Fire V40z Server Unit-Level Environmental Specifications

Specification	State	English	Metric
Temperature	Operating	50° to 95° F	10° to 35° C*
	Non-operating	-40° to 149° F	-40° to 65° C
Humidity	Operating	10% to 90% RH at 80. 6° F max. wet bulb (non-condensing)	10% to 90% RH at 27° C max. wet bulb (non-condensing)
	Non-operating	10% to 90% RH	10% to 90% RH
Altitude	Operating	Up to 9,800 feet	Up to 3,000 meters
	Non-operating	Up to 39,370 feet	Up to 12,000 meters
Vibration	Operating	.20 G, 5 to 500 Hz sine sweep	
Shock	Operating	5 G, 11 ms half-sine	

* The temperature specifications in this table are rated for sea level. For each rise of 300 meters in altitude, the maximum temperature drops by 1° C.

APPENDIX **B**

BIOS POST Codes

Typically, the BIOS displays warning or error messages on the video display in the event of hardware or configuration errors. However, in some cases the error may be so severe that the BIOS halts immediately or the BIOS might be unable to initialize video. In these cases, it can be useful to determine the last Power On Self-Test (POST) task that the BIOS was executing. This is indicated by the value written to port 80.

For information about retrieving the last port 80 post code using the `sp get port80` command, refer to the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide* for details.

You can also retrieve the last 10 port 80 post codes using the operator panel. Refer to the *Sun Fire V20z and Sun Fire V40z Servers—Server Management Guide,* for more details about using the operator-panel menus.

TABLE B-1 lists the BIOS POST codes for the Sun Fire V20z and Sun Fire V40z servers.

TABLE B-1 BIOS POST Codes

Post Code	Description
02	Verify real mode
03	Disable non-maskable interrupt (NMI)
04	Get CPU type
06	Initialize system hardware
07	Disable shadow and execute code from the ROM
08	Initialize chipset with initial POST values
09	Set IN POST flag
0A	Initialize CPU registers
0B	Enable CPU cache
0C	Initialize caches to initial POST values

TABLE B-1 BIOS POST Codes *(Continued)*

Post Code	Description
0E	Initialize I/O component
0F	Initialize the local bus IDE
10	Initialize power management
11	Load alternate registers with initial POST values
12	Restore CPU control word during warm boot
13	Initialize PCI bus mastering devices
14	Initialize keyboard controller
16	BIOS ROM checksum
17	Initialize cache before memory autosize
18	8254 programmable interrupt timer initialization
1A	8237 DMA controller initialization
1C	Reset programmable interrupt controller
20	Test DRAM refresh
22	Test 8742 keyboard controller
24	Set ES segment register to 4GB
26	Enable gate A20 line
28	Autosize DRAM
29	Initialize POST memory manager
2A	Clear 512KB base RAM
2C	RAM failure on address line xxxx
2E	RAM failure on data bits xxxx of low byte of memory bus
2F	Enable cache before system BIOS shadow
30	RAM failure on data bits xxxx of high byte of memory bus
32	Test CPU bus clock frequency
33	Initialize Phoenix Dispatch Manager
36	Warm start shut down
38	Shadow system BIOS ROM
3A	Autosize cache
3C	Advanced configuration of chipset registers
3D	Load alternate registers with CMOS values

TABLE B-1 BIOS POST Codes *(Continued)*

Post Code	Description
41	Initialize extended memory for RomPilot
42	Initialize interrupt vectors
45	POST device initialization
46	Check ROM copyright notice
47	Initialize I20 support
48	Check video configuration against CMOS
49	Initialize PCI bus and devices
4A	Initialize all video adapters in system
4B	QuietBoot start (optional)
4C	Shadow video BIOS ROM
4E	Display BIOS copyright notice
4F	Initialize MultiBoot
50	Display CPU type and speed
51	Initialize EISA board
52	Test keyboard
54	Set key click if enabled
55	Enable USB devices
58	Test for unexpected interrupts
59	Initialize POST display service
5A	Display prompt “Press F2 to enter SETUP”
5B	Disable CPU cache
5C	Test RAM between 512KB and 640KB
60	Test extended memory
62	Test extended memory address lines
64	Jump to UserPatch1
66	Configure advanced cache registers
67	Initialize Multi Processor APIC
68	Enable external and CPU caches
69	Set up system management mode (SMM) area
6A	Display external L2 cache size

TABLE B-1 BIOS POST Codes *(Continued)*

Post Code	Description
6B	Load custom defaults (optional)
6C	Display shadow area message
6E	Display possible high address for UMB recovery
70	Display error messages
72	Check for configuration errors
76	Check for keyboard errors
7C	Set up hardware interrupt vectors
7D	Initialize Intelligent System Monitoring
7E	Initialize coprocessor if present
80	Disable onboard super I/O ports and IRQ's
81	Late POST device initialization
82	Detect and install external RS232 ports
83	Configure non-MCD IDE controllers
84	Detect and install external parallel ports
85	Initialize PC compatible PnP ISA devices
86	Reinitialize onboard I/O ports
87	Configure motherboard configurable devices (optional)
88	Initialize BIOS data area
89	Enable non-maskable interrupts (NMIs)
8A	Initialize extended BIOS data area
8B	Test and initialize PS/2 mouse
8C	Initialize floppy controller
8F	Determine number of ATA drives (optional)
90	Initialize hard disk controllers
91	Initialize local bus hard disk controllers
92	Jump to UserPatch2
93	Build MPTABLE for multiprocessor boards
95	Install CD-ROM for boot
96	Clear huge ES segment register
97	Fixup multiprocessor table

TABLE B-1 BIOS POST Codes *(Continued)*

Post Code	Description
98	Search for option ROMs
99	Check for SMART drive (optional)
9A	Shadow option ROMs
9C	Set up power management
9D	Initialize security engine (optional)
9E	Enable hardware interrupts
9F	Determine number of ATA and SCSI drives
A0	Set time of day
A2	Check key lock
A4	Initialize typematic rate
A8	Erase F2 prompt
AA	Scan for F2 key stroke
AC	Enter setup
AE	Clear boot flag
B0	Check for errors
B1	Inform RomPilot about the end of POST
B2	POST done - prepare to boot operating system
B4	One short beep
B5	Terminate QuietBoot (optional)
B6	Check password
B7	Initialize ACPI BIOS
B9	Prepare boot
BA	Initialize DMI parameters
BB	Initialize PnP option ROMs
BC	Clear parity checkers
BD	Display multiboot menu
BE	Clear screen
BF	Check virus and backup reminders
C0	Try to boot with interrupt 19
C1	Initialize POST Error Manager (PEM)

TABLE B-1 BIOS POST Codes *(Continued)*

Post Code	Description
C2	Initialize error logging
C3	Initialize error display function
C4	Initialize system error handler
C5	PnP dual CMOS (optional)
C6	Initialize notebook docking (optional)
C7	Initialize notebook docking late
C8	Force check (optional)
C9	Extended checksum (optional)
CA	Redirect Int 15h to enable remote keyboard
CB	Redirect Int 13 to Memory Technologies Devices such as ROM, RAM, PCMCIA and serial disk
CC	Redirect Int 10h to enable remote serial video
CD	Re-map I/O and memory for PCMCIA
CE	Initialize digitizer and display message
D2	Unknown interrupt

TABLE B-2 shows the POST codes for the boot block in Flash ROM.

TABLE B-2 Boot Block in Flash ROM

Post Code	Description
E0	Initialize the chipset
E1	Initialize the bridge
E2	Initialize the CPU
E3	Initialize the system timer
E4	Initialize system I/O
E5	Check force recovery boot
E6	Checksum BIOS ROM
E7	Go to BIOS
E8	Set Huge Segment
E9	Initialize Multi Processor
EA	Initialize OEM special code
EB	Initialize PIC and DMA
EC	Initialize Memory type
ED	Initialize Memory size
EE	Shadow Boot Block
EF	System memory test
F0	Initialize interrupt vectors
F1	Initialize Run Time Clock
F2	Initialize video
F3	Initialize System Management Manager
F4	Output one beep
F5	Clear Huge Segment
F6	Boot to mini DOS
F7	Boot to Full DOS

APPENDIX **C**

SCSI BIOS Configuration Utility

Using the Fusion-MPT SCSI BIOS Configuration Utility, you can change the default configuration of your SCSI host adapters. You may decide to alter these default values if there is a conflict between device settings or to optimize system performance.

C.1 Starting the SCSI BIOS Configuration Utility

The version number of the SCSI BIOS displays in a banner on your monitor during boot. If the utility is available, the following message also appears:

```
Press Ctrl-C to start LSI Logic Configuration Utility.
```

This message remains on your screen for about five seconds, allowing you to start the utility. If you press Ctrl-C, the message changes to the following:

```
Please wait, invoking LSI Logic Configuration Utility...
```

After a brief pause, your monitor displays the main menu of the Fusion-MPT PCI SCSI BIOS Configuration Utility.

The following messages might appear during the boot process:

TABLE C-1 Boot Process Messages

Message	Description
Adapter removed from boot order	Appears when an adapter is removed from the system or relocated behind a PCI bridge.
Persistent settings INVALID, defaults saved	Appears if none of the information in the NVRAM is valid.

Note – The SCSI BIOS Configuration Utility is a powerful tool. If, while using it, you disable all of your controllers, pressing Ctrl-A (or Ctrl-E on version 5.00 or later) after memory initialization during reboot allows you to re-enable and reconfigure.

Note – Not all devices detected by the Configuration Utility can be controlled by the BIOS. Devices such as tape drives and scanners require that a device driver specific to that peripheral be loaded. The SCSI BIOS Configuration Utility does allow parameters to be modified for these devices.

C.2 Using the Configuration Utility

All SCSI BIOS Configuration Utility screens are partitioned into fixed areas.

TABLE C-2 Utility Screen Areas

Area	Description
Header	Provides static information text, which is typically the product title and version.
Menu	Provides the current main area menu, if applicable. This area includes a cursor for menu item selection.
Main	For presenting data. Includes a cursor for item selection, horizontal scrolling and vertical scrolling.
Footer	Provides general help information.

C.2.1 User Input

Throughout the GUI, selections that are not permissible are grayed out.

Following are user input methods available from the GUI:

TABLE C-3 User Input Methods

User Input	Description
F2 = Menu	Sets cursor context to the menu selection area. Select a menu item and press **Enter**.
Arrow Keys = Select Item Home/End = Select Item	Up, down, left, right movement to position the cursor.
+/- = Change [Item]	Items with values in [ ] brackets are modifiable. Numeric keypad plus symbol (+) and numeric keypad minus symbol (-) update a modifiable field to its next relative value.
Esc = Abort/Exit	**Escape** aborts the current context operation and/or exits the current screen. User confirmation is solicited as required.
Enter = Execute <Item>	Items with values in < > brackets are executable. Press **Enter** to execute the field's associated function.

C.2.2 Main Menu

When you invoke the Fusion-MPT SCSI BIOS Configuration Utility, the main menu displays a scrolling list of up to 256 LSI Logic PCI to SCSI host adapters in the system and information about each of them.

Use the arrow keys to select an adapter, then press **Enter** to view and modify the selected adapter's properties (and to gain access to the attached devices). You can only access adapters with LSI Logic Control enabled. After selecting an adapter and pressing **Enter**, the adapter's SCSI bus is scanned and the **Adapter Properties** screen appears.

The main menu includes the following two selections:

- **Boot Adapter List** allows selection and ordering of boot adapters. Refer to "Boot Adapter List" on page C-5.
- **Global Properties** allows changes to global scope settings. Refer to "Global Properties" on page C-6.

To execute an item, select it and press **Enter**.

Following are the options on the **Main** menu.

TABLE C-4 Main Menu

Option	Description
Adapter	Indicates the specific family of LSI Logic Host Adapters.
PCI Bus	Indicates the PCI Bus number (range 0x00 - 0xFF, 0-255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Indicates the PCI Device/Function assigned by the system BIOS to an adapter. An 8-bit value mapped as follows: Bit # 7 6 5 4 3 2 1 0 Bits 2-0: Function (range 0 - 7) Bits 7-3: Device (range 0x00 - 0x1F, 0 - 31 decimal).
Port Number	Indicates the I/O Port Number that communicates with an adapter. The system BIOS assigns this number.
IRQ	Indicates the Interrupt Request Line used by an adapter. The system BIOS assigns this value.
NVM	Indicates whether an adapter has non-volatile memory (NVM) associated with it. An adapter's configuration is stored in its associated NVM.
Boot Order	Indicates the relative boot order (0 to 3) of an adapter. The Fusion-MPT SCSI BIOS traverses up to four adapters in the specified order in search of bootable media. Access the "Boot Adapter List" Menu to modify this item.
LSI Logic Control	Indicates whether an adapter is eligible for LSI Logic software control or is reserved for control by non-LSI Logic software.
RAID Status	A status indicates the existence of a RAID array on an adapter and what state its in. "--" indicates no RAID array found on adapter.
Global Properties	Indicates global properties that are not associated with a specific adapter or device.

C.2.3 Boot Adapter List

The adapter boot order specifies the order in which adapters will boot when more than one operating-system adapter is in a system.

Up to four of the total adapters in a system may be selected as bootable. To add an adapter to the boot list, press **Insert** while on the **Boot Adapter List**. This puts the cursor on the adapter select list. Use the arrow keys to select the desired adapter and press **Enter** to add it to the end of the **Boot Adapter List**.

To remove an adapter from the boot list, press **Delete** while the cursor is on the desired adapter in the **Boot Adapter List**.

Following are the options on the **List** menu.

TABLE C-5 List Menu

Option	Description
Adapter	Indicates the specific family of LSI Logic Host Bus Adapters.
PCI Bus	Indicates the PCI Bus number (range 0x00 - 0xFF, 0-255 decimal) assigned by the system BIOS to an adapter.
Dev/Func	Indicates the PCI Device/Function assigned by the System BIOS to an adapter. An 8-bit value mapped as follows: Bit # 7 6 5 4 3 2 1 0 Bits 2-0: Function (range 0 - 7) Bits 7-3: Device (range 0x00 - 0x1F, 0 - 31 decimal).
Boot Order	Specifies the relative boot order (0 to 3) of an adapter. Minus symbol (–) decreases an adapter's relative boot order. Plus symbol (+) increases an adapter's relative boot order.
Current Status	Indicates whether an adapter in the boot list was enabled during the most recent boot. Disabled adapters and their attached devices are ignored by the Fusion-MPT PCI SCSI BIOS although they are still visible to the Configuration Utility.
Next Boot	Specifies whether to enable an adapter upon the next boot. The Fusion-MPT SCSI BIOS ignores disabled adapters and their attached devices although they are still visible to the Configuration Utility.

C.2.4 Global Properties

The **Global Properties** option on the main menu allows you to set display and video modes, as well as a pause if an alert message has been displayed.

Following are the options on the **Global Properties** menu.

TABLE C-6 Global Properties

Option	Description
Pause When Boot Alert Displayed	Specifies whether to pause for user acknowledgement after displaying an alert message during boot. The **Boot Alert** setting can be either No or Yes. To continue after displaying a message, specify No. To wait for any key after displaying a message, specify Yes.
Boot Information Display Mode	Specifies the information display mode of the BIOS during boot. It controls how much information about adapters and devices are displayed during boot. The **Display Mode** setting can be either Terse or Verbose. To display minimum information, specify Terse mode. To display detailed information, specify Verbose mode.
Negotiate with devices	Sets the default value for synchronous and wide negotiations with specified devices. Options are: All, None or Supported.
Video Mode	Specifies the default video mode for the Configuration Utility. The **Video Mode** setting can be either Color or Monochrome. The monochrome setting enhances readability on a monochrome monitor.
Support Interrupt	Allows the ability to prevent a hook on INT40, if required.
Disable Integrated RAID	Tells the firmware not to perform a bus scan searching for RAID member devices. It also disables configuration of RAID arrays in the BIOS.
<Restore Defaults>	Press **Enter** to obtain default settings.

C.2.5 Adapter Properties

The **Adapter Properties** menu allows you to view and modify adapter settings. It also provides access to an adapter's device settings.

Following are the options on the **Adapter Properties** menu.

TABLE C-7 Adapter Properties

Option	Description
<Device Properties>	To view and modify device properties, press **Enter**.
<RAID Properties>	To view, create/delete or configure RAID arrays, press **Enter**.
<Synchronize Whole Mirror>	Copies the data from the primary copy of the mirrored array to the secondary copy.
Host SCSI ID	Indicates the SCSI identifier of an adapter [0-7] or [0-15]. It is recommended that this field be set to the highest priority SCSI identifier, which is 7. *Note:* 8-bit SCSI devices cannot see identifiers greater than 7.
SCSI Bus Scan Order	Indicates the order in which to scan SCSI identifiers on an adapter. Changing this item will affect drive letter assignment(s) if more than one device is attached to an adapter. *Note:* Changing this item may conflict with an operating system that automatically assigns drive order.
Removable Media Support	Specifies the removable media support option for an adapter. Three settings are allowed: **None** indicates no removable media support whether the drive is selected as first (BBS) or is first in the scan order (non-BBS). **Boot Drive Only** provides removable media support for a removable hard drive if it is first in the scan order. **With Media Installed** provides removable media regardless of the drive ordering.

TABLE C-7 Adapter Properties *(Continued)*

Option	Description
CHS Mapping	Defines how the Cylinder Head Sector values are mapped onto a disk without pre-existing partition information. **CHS Mapping** includes two settings: **SCSI Plug and Play Mapping** (default value) automatically determines the most efficient and compatible mapping. **Alternate CHS Mapping** utilizes an alternate, possibly less efficient mapping that may be required if a device is moved between adapters from different vendors. *Note:* Neither of these options has any effect after a disk has been partitioned using the **FDISK** command. To change the CHS Mapping on a partitioned disk, use the **FDISK** command to delete all partitions. Then reboot the system to clear memory or the old partitioning data will be reused, thus nullifying the previous operation. *CAUTION:* Use care to ensure that the correct disk is the target of an **FDISK** command.
Spinup Delay (Secs)	Indicates the number of seconds to wait between spinups of devices attached to an adapter. Staggered spinups will balance the total electrical-current load on the system during boot. The default value is 2 seconds with options between 1 and 10 seconds.

TABLE C-7 Adapter Properties *(Continued)*

Option	Description
Secondary Cluster Server	Indicates whether an adapter has one or more devices attached that are shared with one or more other adapters, and therefore, the Fusion-MPT PCI SCSI BIOS should avoid SCSI Bus resets as much as possible. Allows you to enable an adapter to join a cluster of adapters without doing any SCSI bus resets. The default value is No.
Termination Control	This field indicates whether an adapter has automatic termination control, and if so, its current status. Two settings are available: **Auto**: The adapter automatically determines whether it should enable or disable its termination. **Off**: Termination at the adapter is off. The devices at the ends of the SCSI bus must terminate the bus. *Note:* If **Auto** is gray, it means that termination is automatic, not programmable.
Restore Defaults	To obtain default settings, press **Enter**.

C.2.6 Device Properties

The **Device Properties** screen provides viewing and updating of individual device settings for an adapter.

Changing a setting for the host device (for example, SCSI ID 7) changes the setting for all devices.

Following are the options on the **Device Properties** screen.

TABLE C-8 Device Properties

Option	Description
SCSI ID	Indicates the device's SCSI Identifier.
Device Identifier	Indicates the ASCII device identifier string extracted from the device's Inquiry Data.
Sync Rate	Indicates the maximum synchronous data transfer rate, in mega transfers per second. Mega Transfers per Second / Data Width=8 Mbytes/s / Data Width=16 Mbytes/s / Synchronous Period nsec 0=Async / 0=Async / 0=Async / 0=Async 5 / 5 / 10 / 200 10 / 10 / 20 / 100 20 / 20 / 40 / 50 40 / 40 / 80 / 25
Data Width	Indicates the maximum data width in bits.
Scan ID	Indicates whether to scan for this SCSI identifier at boot time. This item can be used to ignore a device and to decrease boot time by disabling the inquiry of unused SCSI identifiers. Set this option to No if there is a device that you do not want to be available to the system. Also, on a bus with only a few devices attached, the user can speed up boot time by changing this setting to No for all unused SCSI IDs.
Scan LUNs > 0	Indicates whether to scan for LUNs greater than zero for a device. LUN zero is always queried. Use this option if a multi-LUN device responds to unoccupied LUNs or to reduce the visibility of a multi-LUN device to LUN zero only. Set this option to No if you have problems with a device that responds to all LUNs whether they are occupied or not. If a SCSI device with multiple LUNs exists on your system but you do not want all of those LUNs to be available to the system, set this option to No to limit the scan to LUN 0 only.
Disconnect	Indicates whether to allow a device to disconnect during SCSI operations. Some (mostly newer) devices run faster with disconnect enabled, while some (mostly older) devices run faster with disconnect disabled.

TABLE C-8 Device Properties *(Continued)*

Option	Description
SCSI Timeout	Indicates the maximum amount of time [0 to 9999] in seconds to wait for a SCSI operation to complete. Since timeouts provide a safeguard that allows the system to recover if an operation fails, it is recommended to use a value greater than zero. A value of zero allows unlimited time for an operation to complete and could result in the system hanging (waiting forever) if an operation fails. Press **Enter**, type in a value and then press **Enter** again to specify a new timeout value.
Queue Tags	Indicates whether to allow the use of queue tags for a device. Currently the BIOS does not use queue tags. This item specifies queue-tag control to higher-level device drivers.
Boot Choice	Indicates whether this device may possibly be selected as the boot device. This option is only applicable to devices attached to adapter number zero (in the boot list) on non-BBS systems. It provides primitive BBS flexibility to non-BBS systems.
Restore Defaults	Press **Enter** to obtain default settings.

C.2.7 RAID Properties

The **RAID Properties** screen initially displays listing all possible SCSI IDs on the Adapter SCSI Channel. This allows the user to select disks on this channel to be members of a mirrored array. Mirroring provides protection against data loss by storing two copies of the data on separate disks.

Following are the options on the RAID Properties screen.

TABLE C-9 RAID Properties

Option	Description
Array	There are two different mirrored configurations: **Integrated Mirroring (IM)** is a simple sector-to-sector physical mirror of one drive to another drive. This type has two members (not including hot spare). **RAID 1E** is the second type and has a striped layout with each stripe unit having a secondary (or alternate) copy stored on a different disk. This type is used when there are more than two active members in RAID array.
SCSI ID	The SCSI ID that the operating system or application addresses the array.
Size (MB)	The size of the array.
Array Disk?	The user selects a minimum of two disks in this column. A maximum of six disks can be selected; five is the maximum if a hot spare has been selected.
Hot Spare	The user can optionally select a single hot spare. The hot spare disk provides additional protection by automatically replacing an array member when it fails.
Status	Lists the status of each physical disk in the array.
Predict Failure	Indicates whether SMART has determined that the disk will fail in the near future.
Size	Shows the physical size of the disk when not an array member. When part of an array, it shows the size used for the array. The latter will be smaller because when the array is created the size is rounded down to factor in disk-size variances within the same disk class.

TABLE C-9 RAID Properties *(Continued)*

Option	Description
Putting existing Data into a RAID array.	To mirror a disk containing existing data, select the disk with data to be retained first and it will become the primary copy of an integrated-mirrored array. When the first disk is selected, the BIOS configuration utility prompts you to either **Keep Data** or **Erase Disk**. Press **F3** to keep data. Only IM arrays can be created to keep previous data.
Saving Configuration or Exiting the RAID Properties Screen	If finished with this screen, press ESC. If changes were made, you are prompted to save or discard the configuration. Saving the configuration will create the array.
Diagnostics Mode	Before the array is created, press **F4** to display diagnostic codes under the **Size** column for each device on the system. These codes indicate why the configuration utility has disabled selection of some disks. A disk may be disabled for the following reasons: 1 - Problem with reading disk serial number 2 - Disk does not support SMART 3 - Unused 4 - Disk does not support wide data, synchronous mode or queue tagging 5 - User disabled disconnects or queue tags for device (Device Properties) 6 - Unused 7 - Disk not big enough to mirror primary disk 8 - Unused 9 - Unused 10- Disk does not have 512 byte sector size 11- Incorrect device type 12- Hot Spare selection not big enough to be used as an array disk 13- Maximum disks already specified or maximum array size would be exceeded

After an array has been created you can perform the following:

TABLE C-10 Post-Array Creation Commands

<Delete Array>	Deletes the array currently displayed in the **RAID Properties** screen.
<Add/Delete Hot Spare>	Allows adding a hot spare to an existing volume as long as no hot spares are defined. Also allows deleting a hot spare and leaving the array otherwise operational.
<Next Array>	Enabled for illegal configuration situations in which there is more than one array on this physical adapter. The **RAID Properties** screen allows display of one array at a time. This option allows you to display and operate on the next array found.
<Activate Array>	If there are two arrays on a physical adapter, this option allows you select which array should be active. Only one array can be active at a time per physical adapter. Activating an array also causes all the remaining arrays found on the physical adapter to be deactivated.

C.3 Quitting the SCSI BIOS Configuration Utility

Since some changes only take effect after your system reboots, it is important that you exit this configuration utility properly. To exit, press **Esc** and respond to the verification prompts.

Note – If you reboot the system without properly exiting from this utility, some changes may not take effect.

APPENDIX **D**

Supplemental Information

This appendix contains information that supplements the procedures in this guide.

D.1 RAID Support

A redundant array of independent disks (RAID) is a collection of drives that:

- Collectively act as a single storage system
- Tolerate the failure of a drive without losing data
- Operate independently

These servers include LSI Logic's Integrated RAID solution, which supports the Integrated Mirroring (IM) type of RAID:

Note – LSI Logic's Integrated RAID solution also supports Integrated Striping (IS) but this option is not supported on the servers.

D.1.1 LSI Logic's Integrated RAID Solution

LSI Logic offers an integrated RAID solution by simplifying the IM configuration options and by providing firmware support in its host adapters. The software continuously monitors IM volumes and reports status and error conditions as they occur.

Integrated RAID provides the following benefits:

- A low-cost solution.
- Easy to use, install and configure.
- The system can boot from an IM or IS volume.
- No special operating-system-specific software is required.
- High reliability and data integrity.
- Low host CPU and PCI bus utilization.
- Fusion-MPT architecture provides processing power.

Note – LSI Logic provides a BIOS-based configuration utility that enables you to configure the mirroring attributes during initial setup and to reconfigure them in response to hardware failures or changes in the environment. Refer to Appendix D of this guide for more information about this utility.

D.1.2 Integrated Mirroring

With traditional mirroring (or RAID1), a drive has its data duplicated on two different drives using either a hardware RAID controller or software (generally by means of the OS). If either drive fails, the other continues to function as a single drive until the failed drive is replaced.

With integrated mirroring enhanced (IME) (also referred to as either Enhanced RAID1 or RAID1E), instead of being able to use only two drives, you can use two to six drives, including the option of only using an odd number of drives. Instead of mirroring at the disk level, the data is mirrored in stripes across the drives. Thus, IME allows for more flexibility with mirroring data.

The LSI Logic Integrated Mirroring (IM) feature provides data protection for the system boot volume to safeguard critical information such as the OS on servers. Integrated mirroring provides simultaneous mirroring on configurations of two to six disks, to assure fault-tolerant, high-availability data.

If a disk fails, the hot-swap capability allows the system to be easily restored by simply swapping disks. The system then automatically re-mirrors the swapped disk. Additionally, the hot spare feature keeps one disk ready to automatically replace a failed disk in the volume, making the system even more fault-tolerant.

The mirroring is accomplished through the firmware of an LSI Logic controller that supports the standard Fusion-MPT interface. The runtime mirroring of the boot disk is transparent to the BIOS, drivers and OS. Host-based status software monitors the state of the mirrored disks and reports any error conditions. The system is configured with a second disk as a mirror of the first primary disk.

The IM feature uses the same device drivers as the standard controllers, providing seamless and transparent fault tolerance. This eliminates the need for complex backup software or expensive RAID hardware. The IM feature operates independently from the OS, in order to conserve system resources. The BIOS-based configuration utility makes it easy to configure a mirrored volume.

D.1.3 Zero-Channel RAID Not Supported

Zero-channel RAID cards are RAID controller cards that utilize the SCSI chip on the motherboard to configure more advanced RAID setups. These servers do not support zero-channel RAID cards.

D.1.4 Alternative Internal Drive RAID Configuration For Sun Fire V40z Servers (Only)

To achieve other RAID levels not supported by the on-board LSI controller, you can control the internal drives with a RAID card by routing the SCSI cable to it. Cabling a full-function RAID card to the internal drives is supported on the Sun Fire V40z server by routing a standard cable from the backplane to PCI slot 1.

Note – An extender cable attached to the existing cable allows connection to a RAID card in PCI slot 1. Slot 1 is the half-length, horizontal slot under the power-supply cage assembly.

Index

A

Advanced menu, BIOS 8
air baffle, see main air baffle

B

back panel connectors, Sun Fire V20z 5
back panel connectors, Sun Fire V40z 10
back panel LEDs 18
battery, replacing in Sun Fire V20z 34
battery, replacing in Sun Fire V40z 63
bezel, see front bezel
BIOS POST codes 1
BIOS QuickBoot feature 15
BIOS setup utility
  Advanced menu 8
  Boot menu 14
  Exit menu 15
  Main menu 6
  overview 5
  Power menu 14
  Security menu 13
book organization xi
boot block POST codes 7
Boot menu, BIOS 14

C

cables, replacing in Sun Fire V20z 35
cables, replacing in Sun Fire V40z 65
CD/DVD/diskette assembly, replacing in Sun Fire V20z 21
chassis swap, Sun Fire V20z 42
chassis swap, Sun Fire V40z 76
clear-CMOS jumper J110, Sun Fire V20z 47
clear-CMOS jumper J125, Sun Fire V40z 80
common features of Sun Fire V20z and V40z 12
component part numbers, Sun Fire V20z 21, 24
configuring SCSI BIOS 1
connectors, Sun Fire V20z 5
connectors, Sun Fire V40z 10
cooling fan, replacing individual in Sun Fire V40z 32
cooling fans, replacing in Sun Fire V20z 26
cover removal, Sun Fire V20z 2
cover removal, Sun Fire V40z 2
CPU card, replacing in Sun Fire V40z 25
CPU VRM, replacing in Sun Fire V20z 29
CPU VRM, replacing in Sun Fire V40z 44
CPUs, replacing in Sun Fire V20z 37
CPUs, replacing in Sun Fire V40z 53
CRU replacement, Sun Fire V20z, see Sun Fire V20z
CRUs, Sun Fire V20z 12
CRUs, Sun Fire V40z 12

D

daughterboard, see CPU card
DIMMs, see memory modules

diskette device assignment to external USB 16
documentation, related xiii
DVD/diskette drive assembly, replacing in Sun Fire V40z 24

E

esacape sequences, remote console 4
Exit menu, BIOS 15

F

flash ROM boot block codes 7
front bezel, removing from Sun Fire V40z 26
front fan cage assembly, replacing in Sun Fire V40z 34
front panel buttons, Sun Fire V20z 4
front panel buttons, Sun Fire V40z 9
front panel LEDs 18

H

hard disk drive, replacing in Sun Fire V20z 16
hard disk drive, replacing in Sun Fire V40z 21
hard drive bay adapter, Sun Fire V40z 23
hardware components, Sun Fire V20z 6
hardware components, Sun Fire V40z 11
HDD, see hard disk drive

I

I/O board, replacing in Sun Fire V20z 13
integrated mirroring 2

L

LCD display, replacing in Sun Fire V20z 23
LEDs, back panel 18
LEDs, front panel 18

M

main air baffle, removing from Sun Fire V40z 30
Main menu, BIOS 6
memory module population rules, Sun Fire V20z 31
memory module population rules, Sun Fire V40z 49
memory modules, replacing in Sun Fire V20z 31
memory modules, replacing in Sun Fire V40z 49
memory VRM, replacing in Sun Fire V20z 28
memory VRM, replacing in Sun Fire V40z 41
mirroring, integrated 2

O

operator panel
  button functions 13
  location, Sun Fire V20z 4
  location, Sun Fire V40z 9
  menu options 14
  overview 13
operator panel board, replacing in Sun Fire V20z 23
operator panel/LCD assembly, replacing in Sun Fire V40z 29
organization of chapters xi
overview of RAID 1
overview of service processor 12
overview of Sun Fire V20z server 2
overview of Sun Fire V40z 7

P

PCI card, replacing in Sun Fire V20z 14
PCI card, replacing in Sun Fire V40z 13
POST codes, BIOS 1
POST codes, boot block in flash ROM 7
Power menu, BIOS 14
power supply cage, replacing in Sun Fire V40z 39
power supply, replacing in Sun Fire V20z 24
power supply, replacing individual in Sun Fire V40z 37
powering off server 3
powering on server 1

Q

QuickBoot feature 15

R

RAID support overview 1
rear fan cage assembly, replacing in Sun Fire V40z 35
related documentation xiii
remote console escape sequences 4
replacing Sun Fire V20z components, see Sun Fire V20z

S

SCSI backplane assembly, replacing in Sun Fire V40z 30
SCSI backplane, replacing in Sun Fire V20z 18
SCSI BIOS configuration utility 1
Security menu, BIOS 13
service processor
  overview 12
ship kit, Sun Fire V20z 19
Sun Fire V20z
  back panel overview 5
  battery, replacing 34
  cables, replacing 35
  CD/DVD/diskette assembly, replacing 21
  chassis swap 42
  clear CMOS jumper 47
  component locations 6
  component locations for maintenance 4
  connectors 5
  cooling fans, replacing 26
  CPU voltage regulator module (VRM), replacing 29
  CPUs, replacing 37
  environmental specifications 2
  features 3
  front panel overview 4
  hard disk drive, replacing 16
  I/O board, replacing 13
  jumpers and indicators diagram 44
  LCD display, replacing 23
  list of customer replaceable units (CRUs) 12
  memory modules, replacing 31
  memory voltage regulator module (VRM) 28
  motherboard diagram 44
  operator panel board, replacing 23
  operator panel location 4
  overview 2
  PCI card, replacing 14
  physical specifications 1
  power specifications 2
  power supply, replacing 24
  powering off for service 2
  removing cover 2
  replaceable components 21, 24
  SCSI backplane, replacing 18
  ship kit 19
  Super-CRU, replacing 42
  tools for maintenance procedures 1
Sun Fire V20z and V40z
  common features 12
Sun Fire V40z
  back panel overview 10
  battery, replacing 63
  cables, replacing 65
  chassis swap 76
  clear CMOS jumper 80
  component locations 11
  component locations for maintenance 3
  connectors 10
  cooling fan, replacing individual 32
  CPU card diagram 78
  CPU card, replacing 25
  CPU voltage regulator module (VRM), replacing 44
  CPUs, replacing 53
  DVD/diskette drive assembly, replacing 24
  environmental specifications 4
  features 8
  front bezel, removing 26
  front fan cage assembly, replacing 34
  front panel overview 9
  hard disk drive, replacing 21
  jumpers and indicators diagram 78
  list of customer replaceable units (CRUs) 12
  main air baffle, removing 30
  memory modules, replacing 49
  memory voltage regulator module (VRM) 41
  motherboard diagram 78
  operator panel location 9
  operator panel/LCD assembly, replacing 29

overview 7
PCI card slot locations 13
PCI card, replacing 13
physical specifications 3
power specifications 3
power supply cage, replacing 39
power supply, replacing individual 37
powering off for service 2
rear fan cage assembly, replacing 35
removing cover 2
SCSI backplane assembly 30
sixth hard drive adapter option 23
Super-CRU, replacing 76
tools for maintenance procedures 1
Super-CRU, replacing in Sun Fire V20z 42
Super-CRU, replacing in Sun Fire V40z 76
system specifications 1

T

tools for Sun Fire V20z maintenance 1
tools for Sun Fire V40z maintenance 1
typographic conventions xiii

U

USB diskette device, booting 16
using operator panel 13

Z

ZIF cable connectors 36